PERFORMANCE / BUILDING / UPGRADING / GAMING

atomic

MAXIMUM POWER COMPUTING

$5.95 Proudly Australian Issue fifteen

GeForce4 & RADEON 8500
Unnatural graphics

EXCLUSIVE: JEDI KNIGHT II: OUTCAST

PENTIUM 4 GEFORCE4 LAPTOP Yes, LAPTOP!
FACIAL RECOGNITION TECH Enter the game
1 VS. 2 CPU Price/performance lunacy
PC2700 DDR RAM BSRAM more like it
VIDEO NASTIES Graphics card wars

WIN: MSI GF4 MX + Aust IT G... Master

ISSN 1444-8998
15
$AUD5.95 Inc. GST
$NZ7.95 Inc. GST
9 771444 899000

apd INTERNATIONAL PTY LTD
A.B.N. 88 060 392 556

EXTREME PERFORMANCE FOR WINDOWS® XP

The AMD Athlon™ XP 2000+ Available Now!

AMD Athlon MP PROCESSOR | AMD Athlon XP PROCESSOR | AMD Duron PROCESSOR

Authorised Distributor by:
APD INTERNATIONAL P/L
97 Derby Street
Silverwater NSW 2128
Tel: 61- 2- 9737 8277
Fax: 61- 2- 9737 8977
Email: salesinquiry@apd.com.au
Web: http://www.apd.com.au

NEWCASTLE
TEL:(02) 4957-8220
FAX:(02) 4957-8223

MELBOURNE
TEL:(03) 9720-0388
FAX:(03) 9720-0399

MELBOURNE
TEL:(03) 9543-7733
FAX:(03) 9544-0654

DIRECT RETAIL
Email: clive@aplus.net.au

PERTH
TEL:(08) 9445-9500
FAX:(08) 9445-9450

NEW ZEALAND
P.B Technology
TEL:64-9-526 9200
FAX:64-9-526 9207

BRISBANE
TEL:(07) 3846-7588
FAX:(07) 3846-7488

ADELAIDE
TEL:(08) 8221 6222
FAX:(08) 8221 6221

apd INTERNATIONAL PTY LTD
A.B.N. 88 060 392 556

PAYLESS Get MORE

BIOSTAR Mainboard for Socket A Processor

M7VKQ (AMD Recommended Motherboard)

* VIA KLE 133/686B Socket A
* 1xISA,3xPCI, 1xAMR, 3xDIMM
* 200/266 FSB, S/W Audio, ATA100
* CPU Fan Speed
* System Voltage
* System Temperature
* Micro ATX Form Factor
* SD RAM

M7VKD (AMD Recommended Motherboard)

* VIA KT133A/686B Socket A
* 1xISA,5xPCI, 1xAGP, 1xAMR, 3xSDR
* 200/266 FSB, S/W Audio, ATA100
* CPU Fan Speed
* System Voltage
* System Temperature
* ATX Form Factor
* SD RAM

M7VIB (AMD Recommended Motherboard)

* VIA KT266/8233 Socket A
* 5xPCI, 1xAGP, 1xACR, 1xCNR, 4xDDR
* 200/266 FSB, S/W Audio, ATA100
* Ultra DMA33/66/100
* ATX Form Factor
* DDR Ram

Extreme Performance with AMD Athlon™ XP & Duron™ Processors

AMD Athlon MP | AMD Athlon XP | AMD Duron Processor

NEWCASTLE
TEL:(02) 4957-8220
FAX:(02) 4957-8223

Authorised Distributor by:
APD INTERNATIONAL P/L
97 Derby Street
Silverwater NSW 2128
Tel: 61- 2- 9737 8277
Fax: 61- 2- 9737 8977
Email: salesinquiry@apd.com.au
Web: http://www.apd.com.au

NEW ZEALAND
P.B Technology
TEL:64-9-526 9200
FAX:64-9-526 9207

MELBOURNE
TEL:(03) 9720-0388
FAX:(03) 9720-0399

DIRECT RETAIL
Email: clive@aplus.net.au

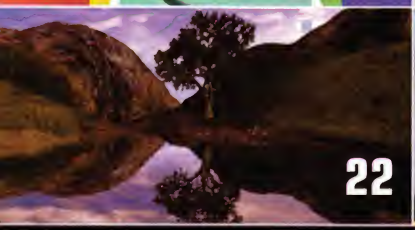
ADELAIDE
TEL:(08) 8221 6222
FAX:(08) 8221 6221

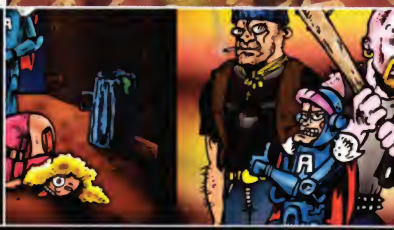
Certificated ISO 9001

FC CE

ISO 9002

atomic contents issue 15





EMAIL

HOT BOX hotbox@atomicmpc.com.au
I/O io@atomicmpc.com.au
LETTERS post@atomicmpc.com.au
COMPETITIONS win@atomicmpc.com.au
SUBSCRIPTIONS subs@atomicmpc.com.au

A little gooder

Atomic is shifting like sands through an hourglass. Subtle shifts, not shifty shifts. We're not here to give you the bad shifts.

Katey Kate had a big shift this month. Since the beginning of Atomic Time, she has used a dual 450MHz Mac G4 to produce *Atomic*. There is a worldwide fallacy – that has lasted many years – which is that designers exclusively use Macs. From desktop publishing to magazine layout, there has been a perception that Macs are better for designers. Clearly this is complete bollocks. I'm so very sick and tired of hearing Steve bloody Jobs evangelise the speed advantages of his 'supercomputer' over a PC. This is all born of the fact that the Mac allegedly runs Photoshop better than a PC. Without Photoshop, Apple would be truly rooted.

Well, sorry Steve, but Photoshop, Quark and Illustrator – Kate's main mag tools – run much, much faster on her new Athlon 1700+, DDR RAM and GeForce2 MX, running under Win XP. Not only faster, but better. XP is a far superior OS to Mac OS9, particularly for designers and anyone using and manipulating graphic files. This new Atomic art box is faster, cheaper and better. I'm not on a Mac-bashing mission here, but I've heard the Mac/Photoshop propaganda more than I need to lately.

Elsewhere in Atomicland, we've added a Communities section in News: from the community, by the community and for the community; each month a certain special Atomican will bring you the lub. This new section connects the mag with the site with the people. Our community is unique and we all know it. There's never been anything like it, because this isn't the way it's supposed to be with mags, and we love that.

Online, there's some shiny tweakage that we're pretty sure you'll be into. Finally we've got our linkage section happening – sorry that took so long folks. Our links are purely Atomicans' personal sites because that's what it's all about. Many are *Atomic* -related and that we especially love: from Mael's brilliant Atomic Waste to Wok's Alyssa Milano shrine, the happyland that is Dude World, Ron3LK's quite amazing Periodic Table and GLOBe's amusing struggles with HTML – it's all a fantastic journey into the minds of Atomicans. Sure, some of it is mildly disturbing, but what the hey, hey?

Speaking of mildly disturbing, *Atomic* has achieved yet another world first: we're the only computer mag in the world to offer a love and loving advice service. Our very own Doc Spooge will have a section on the site and we all look forward to enjoying some sage wisdom. Young lonely hearts can find out what they're doing wrong, while oldies can discover what's left to do wrong. It's very Atomic, and another service to you to meet a perceived need.

Finally, we've launched the Community Events section of the forums. Every month there are so many Atomic events and the rapid pace of the general forum meant that some announcements were bumped off the main page before everyone could see them. Now it's all self-contained and the Cairns m337 has a fighting chance!

Atomic is a steady as the Rock Steady Crew but we shift around a bit to meet your needs. If you're happy, we're happy. That's the reason we all do what we do.

Ben Mansill

atomic
MAXIMUM POWER COMPUTING

EDITORIAL
Editor: **Ben Mansill** bmansill@atomicmpc.com.au
Staff Writer: **Bennett Ring** bring@atomicmpc.com.au
Staff Writer: **John Gillooly** jgillooly@atomicmpc.com.au
Online Writer: **Brad Webb** bwebb@atomicmpc.com.au

DESIGN
Designer: **Kate Marsden** kmarsden@atomicmpc.com.au
Photography: **Chris Walsh**

CONTRIBUTORS
James Wang, Tim Dean, Dan Rutter, George Soropos, Ashton Mills, Des McNicholas, Craig Simms, Stuart Torkington, Simon Peppercorn, Lachlan Newman, Dean Burke, Tremayne Sargeant, Ben Davis

PRODUCTION
Production Manager: **Angela McKinnon** amckinnon@atomicmpc.com.au
Sub-Editor: **Stuart Ridley** sridley@atomicmpc.com.au
Traffic Coordinator: **Jamie Dickson** jdickson@atomicmpc.com.au

Printed by AIW Printing. Distributed by:
Gordon & Gotch Australia (03) 9805 1650
Gordon & Gotch New Zealand (09) 625 3005

ADVERTISING
t + 61 2 8399 3346 f + 61 2 8399 3622
Strategic Accounts Head: **Andy Jackson** ajackson@atomicmpc.com.au
Senior Account Manager: **Cathy Snell** csnell@atomicmpc.com.au
Account Manager: **Joveline Bascon** jbascon@atomicmpc.com.au

AJB PUBLISHING
t + 61 2 8399 3611 f + 61 2 8399 3622
Unit 2–5/44–70 Rosehill Street, Redfern NSW 2016 Australia
Managing Director: **Adrian Jenkins** ajenkins@atomicmpc.com.au
Sales Director: **Simon Corbett** scorbett@atomicmpc.com.au

SUBSCRIPTION ENQUIRIES
t + 61 2 9879 4915

(ajb.publishing)

April - September 2001: 27,575

Finished

Not quite

The easy way to save unfinished business is on a Zip®.

Distributing or archiving valuable work on CDs is fine, once your projects are completed. However, constantly burning CDs while you're still working on your documents is a slow and tedious process that also burns time and money. This is why you should use Zip®. A Zip drive is the quickest and easiest way to save and backup all versions of your work whenever you feel the need to. It means that valuable projects that are on-going are safe from disasters like system crashes, virus attacks or wrong versions being saved. Once safely stored on your reliable 100MB or 250MB Zip disks, your precious work-in-progress can easily be retrieved or moved back and forth between colleagues. To check out Iomega's range of Zip drives call your local computer retailer, visit www.iomega.com or call 1800 IOMEGA. Take care of unfinished business. Save it on a Zip.

MAC OR PC > 100MB OR 250MB > HOST POWERED USB > FULL RANGE OF CONNECTION OPTIONS

iomega®

Short Circuits

The Newcastle Gamers League was forced to postpone its regular LAN event late last month after becoming the first LAN organisation in Australia to receive a rather scary warning letter from the Business Software Association of Australia.

NGL postponed the event in order to consult with both lawyers and the BSAA, hoping to determine any potential liabilities held by NGL with regards to copyright infringement at its LAN events.

According to BSAA guidelines, event organisers can be held liable if they encourage or ignore trade in pirated software.

NGL is still waiting on definitive advice from its lawyers, however it has confirmed that future LANs will go ahead using slightly modified rules and conditions - including a set of BSAA 'guidelines'. These guidelines are aimed at helping LAN event organisers protect their events from potential legal problems associated with warez and other forms of copyright infringement. Though the guidelines are in no way compulsory, it would be advisable for organisations running LANs to use them until they receive proper legal advice. The BSAA LAN event guidelines can be found at www.atomicmpc.com.au/bsaa_lan.asp.

While you're at it, we're interested in what you think of the BSAA and its new interest in the Australian LAN scene. Does this have major ramifications for gamers across the country, making LANs a rare occurance? Or is it yet another small hiccup to be dealt with as part of the LAN organisation process? Make your opinions heard at www.atomicmpc.com.au/forum.asp.

The battle for Silicon Valley

In the business of chip making, producing the fastest product is important. But at the end of the day, nothing is more important than getting the product into the hands of the people: the distributor is the key link to good business.

Try and recall what graphics cards you could buy six months ago and now compare them to todays. Notice anything? Granted, there were the odd KYRO or RADEON, but in the end, NVIDIA chips dominated. Now the situation is different. RADEONs are back in town and even SiS has made a comeback. Small and large board makers alike are jumping off the NVIDIA GPU boat. As you eat your dinner in relative peace, a cold war is underway across the Pacific: Santa Clara, Taiwan and Redmond, Washington are its fearsome and bloody battlegrounds.

As history has shown, it is much more efficient to design the graphics core in-house and out source the production to fab partners and Add In Board (AIB) vendors than attempting the full model. 3dfx tried otherwise, which is part of the reason why the Voodoo became such a scarce sight. The bottom line is a well established board vendor will be able to distribute your card much better than doing it yourself. So what happens when the leading maker of graphics solutions in Europe decides to basically dump NVIDIA's entire line of products in favour of ATI? Nothing really, other than the fact that ATI gets a very healthy boost in shelf space. The reality is not as simple as it seems: we haven't even began to uncover the untold secret sex scandals of the 3D industry.

Although NVIDIA has created product with stunning precision for the last few years, it has been missing a few internal deadlines. NVIDIA releases major product updates every year and refreshes six months in between them. Major updates such as GeForce256 and GeForce3 are codenamed in tens: NV10 and NV20 respectively. The refresh or tweaked versions are codenamed in fives: NV15 and NV25, for example. The GeForce3 was the beginning of all the trouble: an immature 0.15-micron process delayed the production and forced NVIDIA to use the GeForce2 Ultra as a stopgap refresh solution. The second bump came six months after the GeForce3's release. With similar problems, a very hot and over filled NV25 was nowhere to be seen; as a result we have the Ti line up.

Fast forward to today, NVIDIA's NV25 refresh has just been released as the GeForce4 and its relations with board makers is anything but optimal. Hercules and relative small timer OCZ, both once loyal NVIDIA customers, are now in bed with ATI. ATI now has some twenty AIB vendors distributing RADEON products. Since Hercules occupies such a large share of the European retail market, this move will create a short term vacuum for GeForce-based products. To fill in the gap, VisionTEK, the US leader in graphics cards manufacture, will start to expand in to Europe.

And finally ST Microelectronics is selling off its graphics division. With the imminent bankruptcy of ELSA, this adds two more names to the long list of failed 3D companies. Given the small role the PC graphics division plays in the multibillion giant ST, it is no surprise it fell victim. The real question on everyone's minds is: 'What's going to happen to the future of the KYRO?' The purchaser will have the rights to produce the KYRO series of cards all the way to Series 5. All patents however, are still held by PowerVR, which is a separate entity. Design of the next KYRO based on Series 4 technology (STG5500) has been complete some time now and it's believed that it's waiting for the 0.13-micron process to be ready for mass production. It all boils down to who will purchase these rights. While ST was sluggish in pushing its graphics division, the new buyer may view this with more enthusiasm. This may turn out to be a positive move for PVR technology.

Your face, your interface

Games will never be the same, according to Seeing Machines' Market Developer, Gavin Longhurst. Speaking to Atomic shortly after banking a $3.4 million Federal Government grant, Gavin said the Australian company's unique face, head and gaze tracking technology had 'countless' applications for safety, security, telecommunications as well as entertainment.

'Imagine being a Dwarven Cleric wandering around the Shadow Hills in Everquest,' he said, 'But now your avatar's lip, face and eye movements are all synchronised with your own - real time. And so are everyone else's.'

'Or imagine charging into a hall in Quake. The computer knows you're looking at the left hand door, so it spawns enemies from the right. Or it senses that you're buggered or disorientated, so it hits you with everything it's got.'

First used for robotics research at ANU, faceLab attracted the Government's interest because of its potential to reduce road accidents by monitoring driver fatigue.

Using a two camera stereoscopic array, faceLab processes two simultaneous 60Hz video streams of 640x240 8-bit monochrome video to extract facial reference points, 'flat-lining' a Pentium 4 in the process.

Engineering head, Tim Edwards, said the Pentium 4's SSE2 integer registers were ideal for image processing, and future developments would see a 20 degree of freedom model monitoring the full range of facial expressions and changes in behaviour.

'I think virtual reality headsets and 3D goggles have already missed the boat, Tim said, 'The future of games is LCD screens projecting to left and right using head trackers.'

'We've got the first system capable of tracking changes real-time, and it doesn't need headsets, goggles or electrodes to do it. Just sit down and play.'

faceLab technology also promises to get the very best out of processors and 3D hardware. According to Tim, truly immersive displays are only a matter of time: 'We firmly believe that computers will eventually have some sort of empathy with the players,' he said. 'And this can only be achieved through an understanding of facial movement, which will most probably be combined with speech recognition.'

'Tracking systems would allow displays to be optimised for each player. Using View Dependent Degradation Systems, players would see more colour and a higher refresh rate where they're looking without noticing the drop in quality elsewhere. Processing power goes where it's needed, when it's needed.'

Everything has to start somewhere and Seeing Machines has opted for a variation of the famous Rubik's Cube to demonstrate faceLabs gaming potential.

After a simple initialisation procedure, in which reference points are established and then confirmed, players use eye movement alone to spin individual cubes on their vertical and horizontal axis, while a flick to the left or right drops them into their proper place. 'It's a simple demonstrator,' said Gavin, 'But it highlights the future potential of the system - picking things up in games, opening doors, controlling navigation. Games will know which inventory item you want to collect just by following your gaze.'

'Once we're able to track expressions properly, a game's AI characters will know what sort of mood you're in and be able to respond to the player's feelings accordingly.'

Seeing Machines is initially focusing on developing the auto safety applications for its face tracking technology and for this project it will be working closely with a number of major industry players.

Describing the company as 'Young, well funded, windswept and interesting,' Gavin encouraged any job-seeking software developers to check out the Seeing Machines Web site at www.seeingmachines.com

Short Circuits

The picture has cleared on the issue of Vertex and Pixel Shader support in the GeForce4 MX line of cards. The short answer is that the card has neither of these features in hardware. What the chipset does do at a driver level is utilise the CPU for Vertex shading using optimised routines. This really muddies the water for the chipset, as this puts the GPU well behind the GeForce3 in terms of features, even though the GeForce4 Ti is way ahead. For more information see our GeForce4 X-Ray feature on page 22.

Bnetd, an open-source project aimed at giving Blizzard customers an alternative to the company's often lagged Battle.Net multiplayer service, was forced to shut down late last month after Blizzard issued it a Cease and Desist letter citing Digital Millennium Copyright Act violations.

Blizzard called Bnetd's failure to check for and validate CD-keys a copyright circumvention device that encouraged warez versions of Blizzard games. However, rumour has it the real reason Blizzard came down hard on Bnetd was the discovery that someone had modified Bnetd source code to work with Blizzard's Warcraft 3 beta.

While the bnetd.org site itself has ceased offering Bnetd code, many mirrors have sprung to life since Blizzard's DMCA action was revealed, and at time of writing it was still possible to get both the normal Bnetd and the Warcraft 3 compatible Bnetd code. It seems the easiest way to ensure something is widely distributed is to attempt stamping it out using an unpopular law.

Short Circuits

When Arnie uttered the immortal phrase 'I'll be back' in the original Terminator movie, we all figured he was referring to the inevitable sequels and veritable mountains of merchandising such a movie generates. However, what never occurred to us was that he was planning to 'be back' before the original movie itself.

Terminator: Dawn of Fate is a new First Person Shooter currently in development by Infogrames for the Xbox and PlayStation 2. Due for release in October this year, the game is set in the year 2027 - two years prior to Reese's mission to save John Connor's mother in Terminator. You play one of three characters - including Kyle Reese himself - struggling to reach the machine capable of sending Reese back in time to stop Arnie from having his evil way with Ms Connor.

Toshiba recently announced it will be removing the humble floppy drive from its range of laptop computers in favour of Secure Digital memory cards. With recent advances taking SD technology to 128MB, and slated to hit 1GB by the end of this year, the cards will make a welcome replacement to aging floppy technology. In the words of Mark Whittard, National Marketing Manager for Toshiba: 'The time of the floppy drive is over, and it has gone the way of its predecessor'. While we don't necessarily agree with him, it's always nice to see a company other than Apple pushing new technology into the market.

For those prospective Toshiba users who love their old-skool technology, the company will continue to support floppy disks via external USB floppy drives.

Back I say!

Chris Taylor was in town recently to promote Gas Powered Games' latest RPG offering: Dungeon Siege. Naturally, Atomic clammered for a preveiw.

Set in the Kingdom of Ehb, Dungeon Siege puts you in control of a quiet backcountry farmer whose life was rudely disturbed when a mysterious race called 'Krug' laid waste to the surrounding countryside.

From the first few scene-setting moments you're thrown directly into battle, pitched against several ugly looking evil-doers who obviously have nothing better to do than trash your farm and burn your house. A few scrolls and a pitchfork or two are all you have with which to defend yourself but, thanks to the gentle learning curve that pervades Dungeon Siege, you generally manage to vanquish the initial wave of Krug with ease and progress down the road to your first Quest.

The game engine itself is superb. Not only does it produce luscious looking graphics, it's implemented in such a way that you never need see a loading screen. Gas Powered Games was able to constantly stream data needed to render scenes around a character, providing you with a seamless world to explore. In practice, this feels infinitely better than the normal method of loading large chunks of the map each time you venture out of the currently loaded piece of geometry. The upside of all this is that triggering a hidden trap door leading down to a cell full of evil-minded Krug scares the bejesus out of you.

Dungeon Siege is shaping up to be an awesome game. If you're not already an RPG fanatic, this very well may be the game to convert you.

atomican

Welcome to the fabulous first instalment of this thrilling new section in Atomic. 'Atomican' will be dedicated to the cacophony of activity that goes on in our forums, the IRC channel, and general communityness. This comes from the trenches to you via golden Atomican Wilkshake.

In a major announcement, Evil Admin, everybody's favourite admin, has graced upon his underlings of the forums (i.e. - us!) a new section, dedicated purely to all things community related between Atomicans. The aptly named Community Events (www.atomicmpc.com.au/forum.asp?cat=co), is where we can announce all our ideas and suggestions for m337s and LANs, without the fear of them slipping of the front page (*cough* General *cough*). This month has seen many Atomicans heading back to full time schooling or work. The corner wishes all these people the best of luck with their studies. They are our future generation, our most important resource.

February also graced the forums with Virtuoso's campaign to become a serf again. (www.atomicmpc.com.au/forum.asp?cat=ge&top=32108). With any luck (and some begging), his campaign may be fulfilled some time 'early 2002'.

HCB's 'Caption This' continued, (www.atomicmpc.com.au/forum.asp?cat=ge&top=32039 & www.atomicwaste.net/community.htm). Mullet Baggins will never be the same!

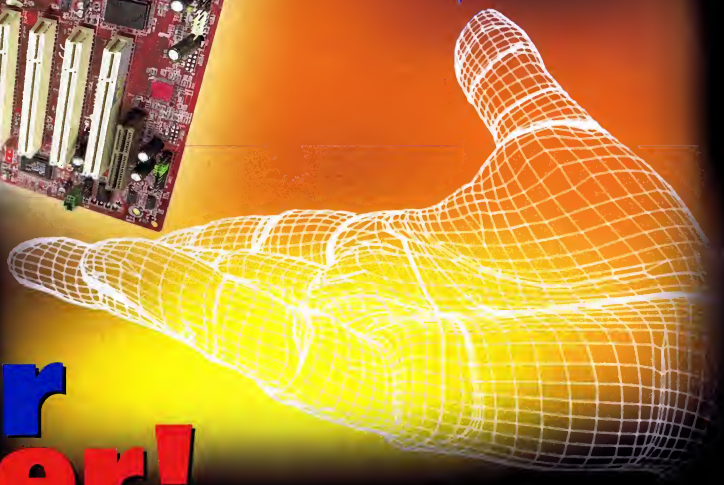
Bolero's 'Jesus: Just a man???' thread was sadly but neccesarily deleted this month, due to the exorbitant amount of system resources it was using (approximately 2.5 Gig) every time the thread was accessed, causing quite a strain on the system. This thread was one of the sources of the general slowdown of the forums of late. Atomic, plus Infojunkie, ChaosLady and others have backed up the main thread, which wil be hosted somewhere for posterity. Those wishing to continue the theological wrangle should do so in 'Jesus: Just a man?????? PART 2' (www.atomicmpc.com.au/forum.asp?cat=ge&top=23752).

Finally, this month saw an annual even which is the bane to some, and boon to others. Valentines Day! With the help of Graymre, ChaosLady, and donnaGEM, some of the male (mael?) Atomicans were able to spruce themselves up for the occasion.

The official: AtomicCountHowManyValentinesSalemiteGotHolyCowWasItThatMany 2002 XP tally is still continuing.

Wilkshake

What's HOT	What's NOT
■ PASSION POP Fine wine can be cheap	■ GRANGE HERMITAGE Sadly not passion flavoured
■ SERIOUS SAM ENGINE Bright, fast and fun	■ QUAKE 3 ENGINE 15 flavours of bland
■ GEFORCE4 TI Latest and greatest in 3D	■ GEFORCE4 MX GeForce4 in name only
■ WOOKIES The real Star Wars heroes	■ JEDI Luke was such a wuss
■ DDR RAM Everybody loves DDR	■ RDRAM Not even Intel love RAMBUS



Star Power!

It takes power ideas to create power products.

Our research and development team is behind all of these powerful innovations. And that's why we are proud to be one of the first to release and embrace new technologies.

MSI is a leader in computer mainboard and peripherals.

Our international depth and knowledge of new technologies provides our customers with new opportunities for ideas and tools to improve business. For more information visit www.msicomputer.com.au

The power of DDRAM is here!

MSI have full range of products, from ATX to mATX covering Intel® P4 and AMD Athlon xp.

845 Ultra-A

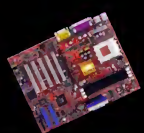
- support DDRAM
- support P4 socket 478 CPU
- Intel 845D chipset
- promise ATA133 (optional)
- promise Raid (optional)
- USB 2.0 (optional)

K7N420 Pro

- support DDRAM
- support AMD AthlonXP
- support upto 3Gb RAM
- Nvida Crash12+MCP-D
- onboard VGA and sound
- Dolby-digital SPDIF out
- TV-Out (optional)

645 Ultra

- support 333Mhz DDRAM
- support P4 socket 478 CPU
- SIS 645 chipset
- onboard sound
- 645 Ultra (MS-6547v1)



K7T266 Pro2-RU

- support DDRAM
- support AMD AthlonXP
- KT266A chipset
- Raid (optional)
- USB 2.0 (optional)

SmartKey · Live Update Series · Live Update Series · D Bracket

For more information visit our website www.msicomputer.com.au

Also Technology
NSW/ACT Tel (02) 9519 4600
VIC/TAS Tel (03) 9560 3388
QLD/NT Tel (07) 3357 4300

Ingram Micro Australia
Tel 1300 65 3333
Fax 03 9545 3326

Tech Pacific
QLD/WA/SA
Tel (02) 9381 6384 or 9381 6254
NSW/VIC
Tel (02) 9381 6270 or 9381 6273

MSI™

Link to the Future

Ah, F**K

We tweak, therefore we are. We are Atomic. Ashton Mills is very Atomic indeed. Too Atomic, in fact. He Atomiced his PC to death. . .

'Ultimately, it was strangely freeing, and I wasn't too fussed in the morning. Life is bigger than this.'

This is the tale of a F**kup Of Epic Proportions. You know the type: the sort of monumental mistake that takes a few moments after the event for the impact to truly hit you. And then, when it does, you sit there staring blankly awhile, unsure of what to do next.

Me, I just casually turned my PC off and slid into bed.

Cue dark, stormy night. Rain rattling against the window, the wind whistling eerily underneath the door, a brown out on the lights as I huddled in my seat, glad to be inside in the warmth of monitor glow.

It was midnight, and I was working on a piece about software RAID for *PC Authority*. In order to safely experiment and benchmark I had plugged in the two SCSI drives from my backup system into my main machine.

Note the term 'backup system' – these drives hold many megs worth of backup data.

BOOM! Lightning struck nearby and the windows danced in their frames. The lights shorted for a moment, but my PC hummed along stubbornly. Where was I? Oh yes, the drives. I had copied all my backup data to my main system – two IDE drives in RAID 0 formation controlled by an onboard Promise chip – so I could create a software RAID 0 array on them using Windows XP.

Everything worked as planned. I then went further and fiddled with registry and BIOS settings, all in the pursuit of performance. As the rain brushed against the window, streaking its aquatic fingers down the glass, I finished my benchmarking and then the piece itself.

In one of those 'just in case' moments I emailed it to my address. Perhaps, somehow, I felt what was coming.

I glanced at my clock. It was 3am. The piece was done, time for bed. . . and then it happened.

The room flashed bright with the light of a magnesium torch, and shook under booming thunder. It formed in my mind. Yes, YES! One last task to be done, one last performance tweak to make to my beautiful RAID array!

The wind howled stronger now, urging me on. Inspired by the lightning strike, I sat down and worked on my beast. Why RAID two when you can RAID four? Out of curiosity, could I cross the hard and soft arrays? What sort of lightning read speeds would I see if I software RAIDed the two SCSI drives with the two IDE drives already in a RAID array on the Promise controller?

And so I created a new, better, stronger array across the three volumes in Windows (the Promise array, of course, appears as a single drive in Windows).

BOOM! For a second the outside world was bright as day, and again thunder rolled through the land. The moment was near! My Franken-RAID, part software RAID, part hardware RAID, would live!

With the skill of a wise and learned hacker that I must certainly be, I clicked to reboot.

And then. . .

Silence. The storm abruptly stopped, the lights flickered as my creation drew more power. . . and then it, too, just stopped.

A fear grew within me: what had gone wrong? When I focused my wild eyes on the screen the emotionless Promise controller told me my hardware RAID was no more.

Ah, F**k.

I collected my thoughts for a moment, then I realised the truth. What had I done to my precious baby?

In creating a software array across the drives, Windows had written its volume information to, undoubtedly, the same area of the IDE drives where the Promise controller keeps its volume data.

I had lobotomised my PC. The data was all still there, of course, in a magnetic fashion, but the array configuration was lost and thus my ability to read the volume. Recreating the array would trash the partition tables (which, in the end, I had to do).

I sighed deeply. I had lost much, more than I cared to consider. This thought process inevitably led me to think about my backups.

Ah, F**k!

A blood-curdling scream rang out across the valley, and the peasants knew then that their secluded mad scientist, locked away in his Geek Abode(TM), had lost his precious.

In his megalomaniac drive for performance, he had zapped all of his beloved creation.

I had lost the giant enchilada, the goat and all the cheese, the super-supreme works-o-rama. The lot. Everything. All. My previous work, my tax info, my address book, poems, short stories, Everquest happy snaps (*sniff*), game savegames, some 700 MP3s I had painstakingly encoded, and much more. Some stuff dated back over ten years.

So that's when I just sat staring blankly at my screen for a while before casually turning off my PC and just slipping into bed. It could wait for tomorrow.

Ultimately, it was strangely freeing, and I wasn't too fussed in the morning. Life is bigger than this.

Still, I kick myself for forgetting to copy back my data to a safe area on the SCSI drives before getting tricky. Lesson learnt kiddies: don't play with fire.

Oh no, that's not it. Lesson learnt: don't play with your backups.

They always said I'd go too far. Tch.

Designed for eXtreme Performance

Without ASUS C.O.P.
Who's the NEXT?

Get the maximum CPU protection with ASUS C.O.P. (CPU Overheating Protection). Even if your heatsink or CPU fan fails, ASUS COP's hardware protection shuts down your system, preventing your valuable processor from going up in smoke.

ASUS C.O.P. Just another innovative feature from the world's leading motherboard maker.

A7V333

A7V333 Specification:

- Socket A for AMD Athlon XP/ Athlon/ Duron 600MHz ~ 2GHz+
- VIA KT333 N.B. with 8233A S.B. Supports 266/200MHz FSB
- 3 x DDR DIMM Support Max. 3GB PC2700/2100/1600 DDR SDRAM
- 5 x PCI, 1 x AGP Pro
- C-Media 6-Channel Hardware Audio with S/PDIF Support (Optional)
- Promise ATA133 RAID 0, 1 (Optional)
- 4 x ATA133 (RAID ATA133 is optional)
- ASUS CPU Overheating Protection (C.O.P.) Support
- ASUS POST Reporter®, ASUS MyLogo®
- Smart Card/Memory Stick/Secure Digital (Optional)
- 4 x USB2.0, 4 x USB1.1, 1 x IEEE 1394 (Optional)
- ATX Form Factor

ASUS C.O.P. (CPU Overheating Protection)
ASUS POST Reporter®
ASUS Q-FAN®
ASUS MyLogo®
RAID ATA133
DDR 333
6-Channel Hardware Audio
S/PDIF
USB 2.0 Ready

National Headquarters
1/14 Hi-Tech Drive, Kunda Park, QLD 4556
Phone (07) 5445 2992 Fax (07) 5445 2069

cassaaustralia

Melbourne Sales Office
Level 1, 329 Mitcham Road, Mitcham, VIC 3132
Phone (03) 9874 3411 Fax (03) 9873 0500

Learn more at www.cassa.com.au or call 1300 365 047

Super, thanks for asking

I think my computer is super – but I don't think it's a supercomputer. Tim Dean looks at Apple's floppy bits.

"In several years it might well turn out that even your wrist watch and toaster qualify as supercomputers"

In one hand, I hold an apple. In the other, I hold an orange. In my other hand, a cumquat. Since I only have two hands, I put the cumquat down, leaving only the apple and the orange.

I want to know which of these nuggets of fruity goodness is better. I want to test them. But how?

I could roll them through the Labs and time them as they pass beneath John's feet. I could juggle them and evaluate ballistics. I could chuck them at Bennett's back and record the sound, or I could even eat them (preferably before I have done all of the above).

A few problems: the grain of the carpet in the Labs (shag. . .) favours the apple, and disadvantages the orange, thus giving an unreliable result; I can't juggle; and the fruit-throwing trick only works against Bennett once before he dodges the orange. And, after I figure all this out, there is no way I am going to eat the things.

Right. Now to the point: it is very difficult to compare apples with oranges (and even more difficult to compare clichés with metaphors). Yet there are many out there who insist that either the apple or the orange is better, and that there is a way of proving this. Funnily enough, one company that insists on making comparisons such as this is Apple. Besides the ubiquitous Photoshop test on Apple's site, which always tends to show that the G4 is massively more powerful than the latest Intel equivalent (even though all the tests of this nature that I've ever run myself have given the opposite result), the other claim that Apple is making about its G4 processors is that they are as powerful as a supercomputer, with the apparent implication that Intel's and AMD's processors are not.

'What makes a supercomputer "super" is its ability to execute at least one billion floating-point operations per second, a staggering measure of speed known as a "gigaflop".' This quote is taken directly from Apple's Web site (www.apple.com), and may be a little misleading, even though it forms a pivotal part of Apple's marketing of the G4 processor.

Most people in the computing world define a supercomputer as simply being one of the fastest types of computer of its day. Supercomputers also typically employ a parallel architecture, and are used for massive scientific and mathematical tasks. Few others, besides Apple, choose to make the definition rigid by placing a quantifying figure by it, such as a gigaflop. The problem with defining it thus is that in several years it might well turn out that even your wrist watch and toaster qualify as supercomputers – which would somewhat dilute the term (not that I wouldn't want some kind of supertoaster).

Gigaflops (billions of floating point operations per second) are also a dubious way of characterising real-world performance since they are generally only used for massive number-crunching tasks or 3D graphics, and not for everyday PC tasks. A floating point 'operation' also just means a single floating point calculation, and different processors can perform different amounts of work in a single calculation depending on their architecture and how much data they handle at once.

Furthermore, I have also never seen any benchmark results showing a G4 pumping out a gigaflop, and even though Apple claims that the 800MHz G4 has a peak theoretical throughput of 5.3 gigaflops, the theoretical figures are, as always, almost meaningless in real life.

For comparison, let's look at a real supercomputer, and see what it can do. Currently, the fastest computer in the world is the IBM RS/6000 SP, also known as ASCI White, based at the Lawrence Livermore National Laboratory. (This might be a bit of a shock to some, but it's true, and Little Jimmy down the road – you know, the dude with the overclocked Athlon PC with the Perspex side, the water cooling and the blinking high intensity LEDs at the front – is talking guff when he boasts 'Nah, man, mine is the fastest computer in the world. Sick eh?')

ASCI White is used for simulating nuclear testing in the US, and you need a shitload of processing power to do this. As such, ASCI White packs a whopping 8,192 processors, 6 Terrabytes of RAM (which amounts to 6,000,000MB of RAM), 160 Terrabytes of disk space, uses 2,000 miles of copper wire, and occupies the space of two basketball courts – or in Australian terms, the space needed for six Skylines to do donuts.

This sucker can pump out a theoretical maximum of over 12 billion floating point operations per second. That's 12 teraflops, or 12,000 gigaflops. It has also been tested with LINPACK, a popular benchmark for testing floating point performance on supercomputers, and managed 7 teraflops, which is almost double the performance of the second fastest computer in the world (sorry Jimmy): the Compaq AlphaServer SC ES45/1 GHz based at the Pittsburgh Supercomputing Center, which itself scored a nudge over 4 teraflops.

So, Apple, the G4 can handle a gigaflop? Well, that's just super. But it doesn't make it a supercomputer. ○

ASUS®

V8460 Ultra Series

Empower Your Graphics Experience

GeForce 4 Ti 4600

- **Powered by the world's most powerful GPU- NVIDIA® GeForce 4 Ti 4600**
- **High speed 128MB DDR video memory**
- **Uses " Immersion Gold Coating " for enhanced reliability and circuit connections**
- **Special "Copper Fan Sink" cooling solution for superiorstability and performance**
- **High quality TV output for big screen gaming or presentations**
- **DVI output for easy connectivity to digital flat-panel displays**
- **High valued software bundle: ASUS DVD 2000 S/W player and the hottest 3D games**

GeForce 4 Ti Series
- V8460 Ultra Series
- V8440 / TD
- V8440 / T

GeForce 4 MX Series
- V8170PRO
- V8170DDR
- V8170SE

Distributor:

Achieva Technology Australia
Tel: 61-2-9742-3288
www.achieva.com.au

Cassa Australia
Tel: 61-7-5445-2992
www.cassa.com.au

Altech Computers
Tel: 61-2-9748-2233
www.altech.com.au

ASUS®

www.asus.com

Fin flummery

Dan Rutter takes a chill pill, shoots up some Arctic Silver and cuts himself on an HSF fin, realising that naptha fluid is not calamine lotion.

'A fan with twice the air flow won't give you twice the performance. It probably won't even give you 50% better numbers.'

I've written this CPU cooler comparison. It is, roughly speaking, the size of a cow. You can read it at www.dansdata.com/coolercomp.htm. Plug plug.

In the course of writing this comparison, I have learned some general things about CPU coolers. Since there are about a squillion coolers out there that I haven't even seen, it helps to have some rules of thumb to tell you whether they're likely to work well or not.

Fact number one. If a CPU cooler looks funkalicious - laydown design with the fan on one end, tubular radial-fin centre-fan layout, some kind of wiggy rotary retention mechanism - there's a good chance that it's rubbish.

I've seen several Cool Looking Coolers that work well, or are at least OK value for money. But I've seen rather more that don't, and aren't. Something that looks like a turbo intercooler from Kaneda's bike in *Akira* is the computer-component equivalent of a concept car probably for looking at, not for driving.

If a cooler has an all-copper heat sink of unremarkable design with an irritatingly loud fan on top, it'll probably work very well. It's possible to make a cooler like this and end up with a lousy product - use the wrong fin design and you can turn anything into a paperweight - but it's not likely that such a cooler will stink.

Whether you'll be able to tolerate the racket of a seven watt 60mm fan, though, is another question.

If a cooler's got a copper heat sink but a much less irritatingly loud fan, it'll probably work more than well enough for even quite serious overclocking, especially now that Northwood Pentium 4s and Palomino Athlons are lowering CPU heat output a bit.

The slower fan will also be less likely to suffer from bearing death after a year or two. And, indeed, less likely to awaken the brain-hungry dead from their dreamless slumber.

If a cooler has a gigantic heat sink with an 80mm fan sitting on top of it, and that heat sink is all-copper or has a copper slab in its base, then it also is likely to work well. Provided you can fit it onto your motherboard.

If a cooler has a normal-sized heat sink with an 80mm fan on top of it, funnelled down onto the sink with a 'fandaptor' widget, then the cooler's performance is much less likely to excite you. Fandaptors are all inefficient: normal computer fans don't have much static pressure capacity, so they don't work well into a funnel. But 80mm fans are quieter than 60mm ones, all things being equal; that helps.

A fan with twice the air flow won't give you twice the performance. It probably won't even give you 50% better numbers.

More air flow is always better, but opening up your case ventilation so the air hitting the CPU heat sink hasn't been pre-heated by other components will get you better results than dropping a jump-jet fan onto the cooler and leaving the overall air flow lousy.

For similar reasons, twice as much heat sink doesn't mean twice as much heat dissipation. If the input heat was evenly spread over the whole heat sink base, then things might be different. But all socket PC CPUs contact their heat sink in a quite small area - a very small area, for pre-Tualatin FC-PGA Socket 370 and Socket A chips - which means that giant heat sinks in general aren't nearly as good per gram as smaller ones, and giant all-Aluminium heat sinks don't necessarily work very well at all.

Pentium 4s do all right with Aluminium coolers, because their coolers are all large, and so's their contact patch. Small-patch CPUs, though, need at least a copper base to spread the energy to a large heat sink.

The trouble with giant heat sinks is that the further away from the heat source you look on your CPU cooler the size of a shoebox the less of the heat will actually have managed to make it to that point.

The outer fins on giant Aluminium heat sinks commonly aren't doing much of anything. The heat path from the CPU to those fins is sufficiently resistive that they might as well not be there.

People also keep emailing me and saying 'I'm concerned about my CPU temperature, it's [Centigrade reading from 50 to 90 degrees], what can I do?'

Well, I say in reply, you can do nothing, if your computer doesn't crash all the time. No crashes, no problem. Maybe a too-hot CPU won't live as long as it otherwise would. Never mind: you'll almost certainly upgrade before the thing dies, anyway.

Most Socket A systems use CPU temperature sensors outside the processor; no two read the same. Even systems that use internal CPU temperature sensors can be bizarrely miscalibrated. Excessive heat will, at worst, just cause your computer to crash but it won't actually cook your CPU.

If there's no CPU cooler at all then you can get Socket A CPUs to smoke up and kill themselves and their motherboard, but any degree of real cooling makes that functionally impossible. Probably.

What's the most important thing I've learned, though?

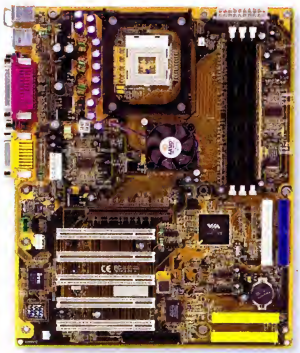
Probably this: Nothing gets thermal grease off stuff like naptha lighter fluid.

And if the stain just won't budge, naptha also makes it easier to destroy the evidence.

The Award Winning King and Queen

invite you to the Kingdom of DDR

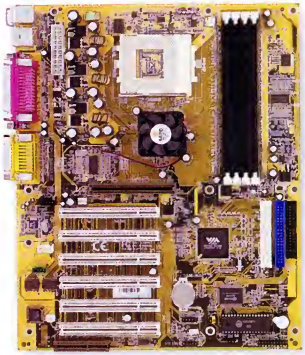
King of Glory AV40R



pentium 4 P4X266

- INTEL Socket478 P4 Processor Support
- VIA P4X266 Chipset
- User Friendly Jumper-less Design
- BIOS Programmable FSB Speed
- BIOS Adjustable CPU Multiplier
- BIOS Adjustable CPU Core Voltage
- BIOS Adjustable DDR Voltage
- BIOS Adjustable Chipset Voltage
- BIOS IRQ Assignment
- 3 Phase Power
- North Bridge Fan
- 3 DDR DIMMS (Up to 3GB)
- 5 PCI Bus Master
- USB Cable Bundled
- Optional RAID (Model: AV40R)

Queen of Elegance AK31



AMD Athlon XP KT266A

- AMD Athlon/ Duron/Athlon XP Support
- VIA KT266A Chipset
- User Friendly Jumper-less Design
- BIOS Programmable FSB Speed
- BIOS Adjustable CPU Multiplier
- BIOS Adjustable CPU Core Voltage
- BIOS Adjustable DDR Voltage
- BIOS IRQ Assignment
- 3 Phase Power
- North Bridge Fan
- 4 DDR DIMMS (Up to 4GB)
- 6 PCI Bus Master
- USB Cable Bundled (Optional)

Shuttle®
www.spacewalker.com .

Manufacturer:
Shuttle Inc. TAIWAN

Tel: 886-2-8792-6168
Fax: 886-2-8792-6268
E-mail: sales@mail.shuttlegroup.com.tw

SATO TECHNOLOGY

SATO Technology Pty Ltd
www.satotech.com.au
E-mail: gary@satotech.com.au

Box Hill South, VIC	QUILDFORD, NSW	KINGSGROVE, NSW	ROCKLEA, QLD	OSBORNE PARK, WA
Tel: (03) 9899 6333 Fax: (03) 9899 0200	Tel: (02) 9721 0988 Fax:(02) 9721 3666	Tel: (02) 9554 3826 Fax:(02) 9554 9589	Tel: (07) 3255 6899 Fax:(07) 3255 6459	Tel: (08) 9244 9899 Fax:(08) 9244 2280

moz's Dog Box

Technical details

- Athlon XP+1600 + Super Orb HSF
- Asus A7V133
- 256MB 133MHZ RAM
- Hercules GF2 MX 32MB + TV Out
- 30GB IBM ATA100 7200rpm HDD
- Sound Blaster Live! Value
- AOpen 10/100 Ethernet
- 8x DVD ROM Drive
- 8x/4x/32x Sony CD-R/RW
- Ultra El Cheapo case
- Three 80mm fans
- Perspex window
- Tube of Death
- Vent holes in RHS of case

The story

This is pretty much Atomic's doing: I have been reading the mag since its inception, and before then I had never heard of modding. Once I'd seen what you could do, I was impressed. So. . . to work!

Following Atomic's excellent tutorials, I ended up with a box that looked very similar to the modded machine in the mag. An orange Perspex window (including the 'Tube Of Death' over the CPU HSF); a neon light (a lovely shade of red!); three case fans comprising of a blow hole, another blower at the back of the case, and an intake at the front of the case; and a little coloured convoluted tubing on the wiring. And voila! The Dog Box was born! The only unusual mod is the ventilation on the RHS of the case. I cut holes all the way through to the mobo and placed the grills over them. The blowing fans suck in air through the grills, cooling the back of the mobo and dropping the temperature by about 2 degrees. Painting is next on the agenda, plus a few other things to set it apart.

Vlad's Vlad Box

Technical details

- Pentium III 550MHz @ 778MHz
- 320MB PC100 RAM
- 32MB Vanta
- Sound Blaster Audigy DE
- 17.2GB Seagate HDD
- 8x4x30 CD-RW
- 44x CD-ROM
- Enermax 350 watt PSU
- Rounded Cables
- Neon + LED lighting
- Perspex window
- Custom made 7v/0ff/12v Baybus
- 4 Case fans
- Case handles

The story

It's either you have your case modded or you're planning to these days. I saw all the mods in Atomic so I needed to do it. The planning was done, the case was scared and then I went at it with the power tools. After lots of cursing, and some mistakes I was lucky to end up with this. The paint job was easier than I thought it would have been and my sister did the flames. The cooling is ample with a dual 80mm fan intake, a 92mm exhaust on the back and an 80mm exhaust on the top. The Baybus took me several days to complete and helps keep the noise level down when running the fans at 7 volts. The neon didn't provide much light up top so I used LEDs to brighten things up a bit. The case handles and the custom case badges complete the mods.

While the hardware is old and crummy the overclock brings it up to par a little bit and it actually runs all the latest games. . . just. An upgrade seems to be in order but this does the job for now. I am pleased with the results of the case.

Proud of your Hot Box? Send us a pic and you could win a free six-month subscription to Atomic! hotbox@atomicmpc.com.au

Ron's PowerZone

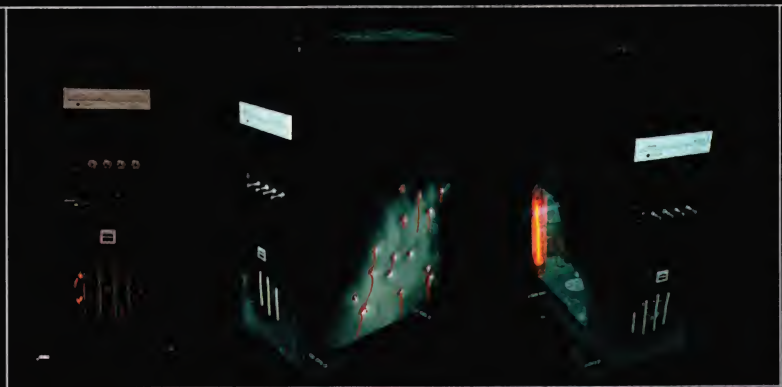
Technical details

- MSI K7T266A Pro2 – RU
- Athlon 1700+XP
- Audigy soundcard
- Enermax EG365P VE PSU
- 512 MB Crucial PC2100 DDR
- 20GB IBM GXP60 7200rpm HDD
- CDRW HP8100+
- AGP - MSI 64MB GeForce GTS
- PCI - Palit Riva TNT2 M64
- 16X Pioneer 105S Slot-load DVD
- Alpha PAL 8045 HSF
- ThermalTake Tiger N/bridge HSF
- Below Zero Ocelot on GPU
- HDD cooler with Flashing LEDs

The story

The first mod was the most time consuming and difficult – cutting the stock Lian drive plates to take the DVD, CDRW, HDD cooler, CompuNurse, RheoBus and Floppy drives. . . to achieve that "chiselled out of Aluminium" look! Next, a 'frameless' window and top porthole were cut out, and painted 80mm side-fans, a DVD window and 92mm top exhaust were all added. An 80mm fan was cut into the motherboard-side cover, to supply 'cool' air to the back of the CPU via a hole cut in the slide-out MoBo tray. All of the external fans have stainless biohazard grills from PC Case Gear. Rounded cables move the data, while 3 blue neons, a flashing front air filter, flashing HDD cooler, illuminated FanBus and 2 red LaserLEDs take care of the lighting. All of the wiring was rounded, with the audio cables encased inside aluminium tubing. An old PSU case was gutted, fitted with the converters for the neons and BayBus wiring, and takes up the spare space at the back of the two bottom 5.25 bays.

Dumass' Box



Technical details

- AMD 1GHz Athlon
- Gigabyte GA-7ZX-r mobo
- 768MB PC133 SD RAM
- Leadtek GeForce2 Pro 64MB
- 250W Enermax PSU
- SBLive!
- 12x10x32 AOpen CD burner
- 52x Stealth modded CD-ROM
- 56k Dynalink modem 10/100
- 2x 60GB ATA133
- 3x 120mm intake fans
- 2x 80mm + 1x 120mm out fans
- Custom bay bus
- Full tower case with red neon

The story

One night I had been playing Quake 3 for so long I got ambushed, and not thinking, I took cover behind my PC ;). Bullet holes were made with a .45 hunting rifle (no that's not real blood). The main idea in this case was to hide ALL those ugly fan grills that I see on so many cases. Front intake fan is mounted on some drain pipe that is glued to a hole in the front of the case, with steel bars for the grill. This was done successfully, but even with the 300cfm intake air flow, my mobo is holding me back from overclocking :(. All the drilling cutting and modding was done by hand, I didn't have a Dremell, just hand tools and a drill press. My case is now for sale as I am going to setup a water cooling rig, and don't need the all the airflow (enquiries: dumass@paradise.net.nz).

I think that the real point is to show that firearms can be fun if used creatively. Hopefully the Australian Army will allow me to increase airflow by lending me a 105mm Howitzer.

Proud of your Hot Box? Send us a pic and you could win a free six-month subscription to Atomic! hotbox@atomicmpc.com.au

all metalbox systems come with 1 year Australia wide onsite warranty**

[Ti] HOME / STUDENT UNITS

The ti series offers a wide range of variable configurations to provide you with a complete home solution. From configurations optimised for business applications such as word processing, email functions, and data entry to complete solutions configured to handle all types of day-to-day applications.

TiF3

Intel® Pentium® 4 Processor 1.7 GHz
Pentium® 4 DDR Motherboard
256MB Pc266 DDR Ram
GeForce 2MX 64MB
30GB ATA100 HDD
BENQ® 52X CDRom
BENQ® 24x10x40x CDRW
BENQ® 17" Monitor
BENQ® Keyboard & Mouse
56K Internal Modem
TV Tuner Card
Creative DTT5300 + SBLive 5.1 SE
Microsoft® Windows® XP Home

$3029 $29.77 per week*

[Be] GAMING UNITS

Do you have a favourite game that is not playing quite right on your current system?
Let metalbox build you a machine that is optimised for gaming.

BeF3

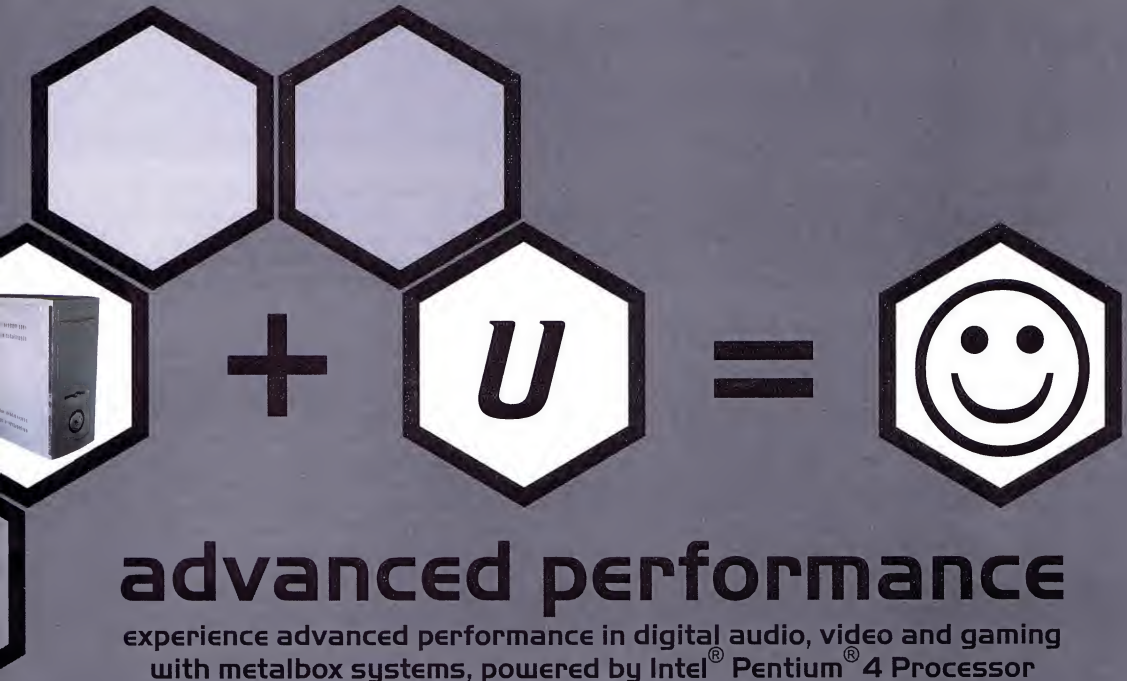
Intel® Pentium® 4 Processor 2.2GHz
Pentium® 4 DDR Motherboard
1GB Pc266 DDR Ram
Hercules Prophet III Ti500 64MB DDR
2X30GB HDD with RAID-0
Intel® Pro 1000T NIC
BENQ® 16X DVDRom
BENQ® Keyboard & Mouse
Creative Audigy Platinum
Creative DTT3500 Speaker
Sony 21" Monitor
Microsoft® Windows® XP Pro

$8545 $71.08 per week*

*Intel® Financial Services payments quoted are based on a 36 month commercial rental agreement or consumer lease, payable monthly. Rental payments include GST. Subject to credit approval. Conditions apply.

**Onsite warranty services provided by Warranty Assistance Australia (WAA). Please call 1300 653 394 to confirm coverage in your area.

All images are for illustrative use only. All prices are GST inclusive and for cash or bank cheque only. E & OE Prices are subject to change without notice. All card transaction might incur a surcharge where applicable.



advanced performance

experience advanced performance in digital audio, video and gaming with metalbox systems, powered by Intel® Pentium® 4 Processor

and be happy!

metalbox

[Pt]

WORKSTATION UNITS

With first-class performance and high flexibility the **pt** series is a powerful workstation that focuses on business workstation, computer aided design (CAD), digital content creation, geographic and information systems, computer animation, software development, and financial market analysis.

PtO2

Intel® Pentium® 4 Processor 1.7GHz
Pentium®4 DDR Motherboard
256MB Pc266 DDR Ram
GeForce 2MX 32MB
30GB ATA100 HDD
Intel® Pro 1000T NIC
BENQ® 24x10x40x CDRW
BENQ® 52X CDRom
BENQ® 15" Silver Flat Panel
BENQ® Keyboard & Mouse
Microsoft® Windows® XP Pro

$3429 $33.69 per week*

PtF5

Intel® Pentium® 4 Processor 2.0GHz
Pentium® 4 DDR Motherboard
1GB Pc266 DDR Ram
Elsa Quadro 2 Pro 64MB DDR
2X80GB HDD with RAID-0
Intel® Pro 1000T NIC
BENQ® 16X DVDRom
BENQ® 24X10X40 CDRW
BENQ® Keyboard & Mouse
Sony 19" Monitor
Microsoft® Windows® XP Pro

$8020 $66.69 per week*

www.metalbox.com.au

HOTLINE: 1300 654 637 FAX: 03 98769912

Twice the nFinity

Into the guts of the GeForce4. James Wang and John Gillooly are your gastronomical tour guides.

64 Million Transistors are a lot to use on a 3D processor. Since the introduction of programmable GPUs, transistor use on modern chips has shifted away from the implementation of specific hardwired features to overhead usage creating a more efficient and flexible architecture. In this sense, GPUs are becoming more like CPUs; generalizing their nature at the cost of more transistors. The GeForce4 benefits from the extra silicon through many functional improvements as well as a thorough overhaul of its 3D pipeline to streamline performance.

Double the fun

nFiniteFX II is the heart of the GeForce4's dual vertex and pixel shading pipelines. Geometry acceleration is given a massive boost with the inclusion of a second vertex shader and higher clock speeds that put the GeForce4 at a peak vertex output of 136 million verticies per second – an approximate three-fold increase over the GeForce3.

Most of the improvements to the geometry pipeline will be transparent to both the end user and developer.

NVIDIA optimised the GeForce4's vertex pipeline by diving the XGPU's dual vertex shaders in action and eliminating any stall conditions and pipeline bubbles that were found. A lot of work has gone into removing bottlenecks in the vertex and pixel pipelines: new data paths have been added, buffers re-adjusted and overall flow is much smoother. NVIDIA has also widened data paths to optimise performance for specific scenarios such as dual texturing and trilinear filtering at full speed.

Vertex shaders are a big deal because you can expect them to be used widely in the not too distant future and NVIDIA is so excited about them that its built its own 'Wolfman' demo. This is no ordinary tech demo either, featuring 100,000 polygons, 61-bone skeletal animation, real time tissue deformation and anisotropic lighting enhanced fur! NVIDIA is claiming a landmark in real time 3D rendering of fur and skin and it seems it's not all hype because the demo really is quite a jaw dropper. Unfortunately, the GeForce4 MX will not be able to run this demo. For starters, its vertex shader is CPU emulated and most indications point to a non-existing pixel shader. In essence it does not have the nFiniteFX engine as architecturally it is more of an updated GeForce2 than a cut down GeForce4.

The wolfman, whose structure and furriness come courtesy of nFiniteFX II

Lightspeed Memory Architecture II

NVIDIA has made several new optimisations in its LMA architecture to help solve the memory bandwidth crisis: the ingenious cross bar memory controller is carried forth to the GeForce4 with no apparent changes. Basically a 128-bit DDR interface is segmented into four separate 32-bit DDR channels to allow greater access granularity and enhance efficiency for small data transactions. The MX version has a simpler version, with a two way cross bar resulting in dual 64-bit DDR channels.

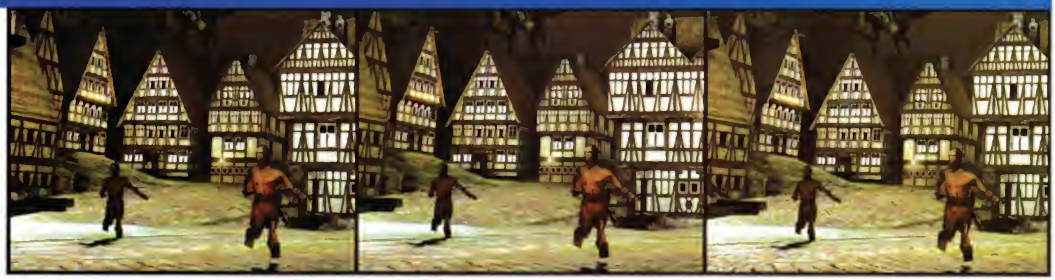
Like its predecessor, the GeForce4 also sports Fast Z Clear and Z compression. Since Z-buffers are normally read and written for every pixel that is rendered, they are a gluttonous consumer of memory bandwidth. Z-Compression was introduced in the GeForce3 and provided a 4:1 compression ratio for certain types of Z-buffer traffic. However great the technology was, it had certain limitations. For example Z-compression and FSAA did not work together. The GeForce4's Z-compression now works with FSAA and can compress more than 80% of the pixels' Z values. NVIDIA's proprietary Z-compression scheme is completely lossless, meaning compression does not affect data integrity. Fast clear is also used to keep the Z-buffer nice and clean without clogging precious bandwidth.

Z-Occlusion Culling

There's no better way to speed things up than to not compute at all, which is what Z-culling tries to do. By depth testing and removing invisible pixels before they are rendered, fillrate and bandwidth are conserved. NVIDIA's whitepaper does not indicate that this area has been improved from the GeForce3 but the overdraw benchmark, VillageMark, has shown that the GeForce4, clock for clock, handles overdraw 25% better than the GeForce3.

Quad Cache and Auto Pre-charge are two new features added to the LMA. The LMA's cache subsystem includes primitive, vertex, texture and pixel information. NVIDIA calls this collection 'Quad Cache'. Caches are high speed, low latency access buffers that really help out the bandwidth in critical situations. For example, when doing trilinear filtering, eight texels needs to be fetched per pixel, which would constitute an 8x bandwidth penalty. Texture data can be buffered with the use of texture caches, and the near instant access speed means we can enjoy the thrill of trilinear filtering with little performance slowdowns.

You can think of auto pre-charge as the opposite of fast Z clear. Just as it takes time (latency) and bandwidth to clear the Z-buffer, it takes a great deal of time to prepare (activate) DRAM if it is not directly next to the current row/column of an active



No, they aren't the same. The left image has no AntiAliasing, the middle uses the GeForce3 era Quincunx and the right uses the new 4xS Accuview method.

bank. This process can take many clock cycles and leave the GPU unfed. Auto pre-charge allows the GPU to charge an area of memory that is likely to be used next. If the prediction is correct, then the GPU is able to access memory with greatly reduced latency.

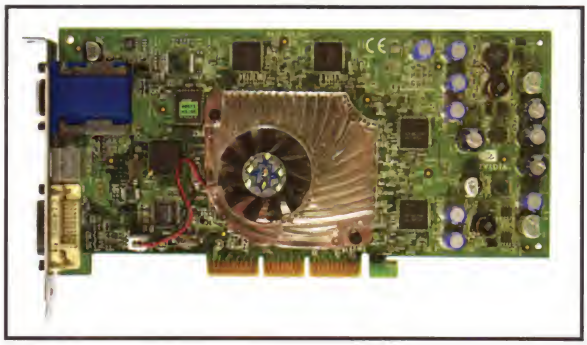
New contacts: Accuview

Accuview is the new anti-aliasing system offered by the GeForce4. By using multi-sampling, texture samples are only used once for all sub-samples. This means there is no fillrate penalty like super-sampling (GeForce2, RADEON and KYRO). Accuview takes this one step further by providing wider internal data paths so that multiple sub-samples travel down the pipeline simultaneously, effectively doing AA in parallel. In this sense, the GPU 'knows' that multiple sub-samples will be needed to calculate the final colour and hence provides 'virtual sub-samples' at full speed, since the internal data path is wide enough. The only thing preventing FSAA without a performance hit when using multi-sampling is bandwidth.

Accuview also uses a new sampling pattern when computing anti-aliasing. Quincunx was a broad filter that included adjacent pixel information and hence had a blurring effect. Accuview shifts the sampling positions such that it will collect two smaller errors instead of one large one as in Quincunx; this improves edge AA and is far more accurate.

The GeForce4 includes a new mode of FSAA called 4XS, which incorporates anisotropic filtering. This mode is likely to be a hybrid of Super and Multi-sampling and also clarifies textures. NVIDIA claims it offers 50% more sub-pixel coverage and greater texture detail. The quality as you can see is very impressive and texture clarity is quite significantly improved.

While the GeForce4 has been boosted in transistors, clock speed and feature optimisations, the really big improvement is actually outside the 3D area. The GeForce4 now features a Video Processing Engine. This dedicated piece of silicon provides for hardware DVD playback and TV/HDTV de-interlacing options. The major component in VPE



MSI's GF4Ti4600-VTD engineering sample. The HSF blows cool air over the RAM!

is full MPEG-2 decode which includes inverse quantisation, inverse discrete cosine transform, motion compensation, colour space conversion and alpha blending. NVIDIA aims to reduce CPU utilisation by 90% with VPE, which also performs adaptive de-interlacing to accurately present interlaced content on the PC monitor. It uses a combination of weave and bob methods to perform the conversion and this is partly done through the 3D GPU.

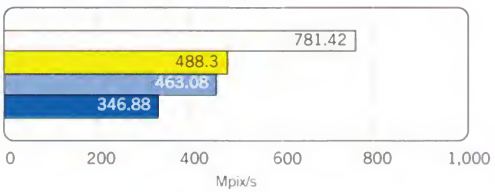
While improvement in this area is aimed squarely at ATI, NVIDIA also managed to squeeze in nView for the GeForce4: a multi-display solution that NVIDIA claims to be the most comprehensive hardware and software package in the industry. Powering nView are two separate 350 MHz RAMDACs and dedicated LVDS and TMDS transmitters for notebook LCD and flat panel displays. The multi-display software has greatly improved since the days of TwinView. nView allows up to 32 individually customized desktops integrated with the nView manager. The robust package also includes a host of features ranging from transparency to multiple profile options.

Faster and faster

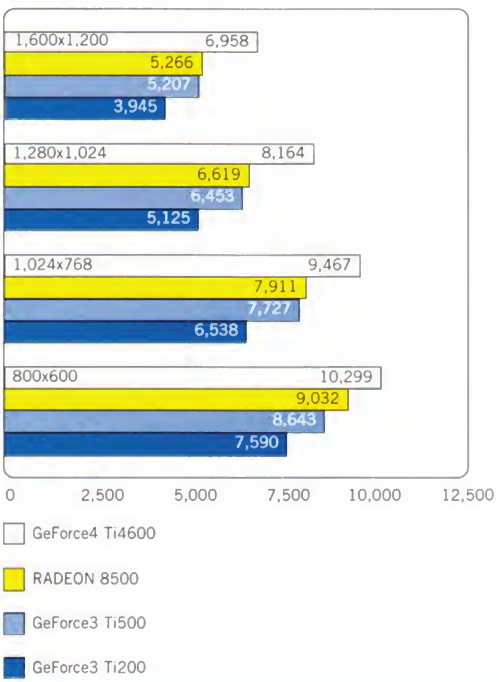
With such an extensive tweaking of feature sets and focus on bandwidth optimimisation, the expectations of the GeForce4 Ti are high indeed. Ever prepared for disappointment, we ran up a high end MSI G4Ti4600-VTD card on our Athlon testbench. We used 3DMark2001SE Pro, Serious Sam: The Second Encounter Demo and Quake 3: Arena to get an idea of how the card performs.

In 3DMark2001SE Pro the results are astounding. The difference between the GeForce4 Ti4600 and the RADEON 8500 started out at

Serious Sam SE Fillrate



3DMark2001SE Pro



15% at 800 x 600 and rising to a whopping 32% at 1,600 x 1,200. Who would have thought a few months ago that the GeForce3 Ti500 would be relegated to third place in Direct3D?

An even greater gulf appears in the Serious Sam SE synthetic fillrate benchmark. In the fully multitextured, blended and z-buffered test the GeForce4 Ti4600 delivers a fillrate that is 60% greater than the RADEON 8500, and 68% greater than the GeForce3 Ti500. This result is largely thanks to LMA II, and indicates that maybe NVIDIA has finally broken the back of the seemingly neverending bandwidth problem.

This brings us to AntiAliasing performance: all of NVIDIA's new technologies point towards being able to use AA more often, as the extra bandwidth and optimised filters reduce the performance hit. We tested the four available AA modes in Quake 3: Arena and 3DMark2001SE Pro. There is still a slug in performance when using these modes, and it increases relative to resolution. However the frame rates are still very playable, only dropping to borderline speeds at 1,280 x 1,024.

Roll your own

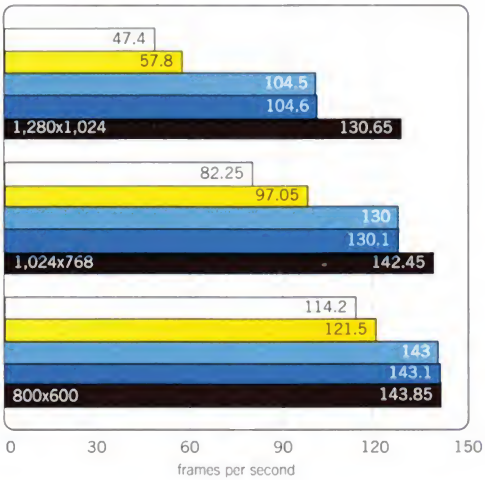
It can't be denied that both NVIDIA and ATI have done a fine job in supplying us with first-rate 3D hardware. A few years back we weren't satisfied with the hardware but now software (games) have lagged behind the development cycle. Chip producers are no longer responsible for the bottleneck of our industry – instead, it's formed by the duet of software developers and API standards.

After not reaping much tangible benefit from the mass hype of T/L, gamers have kept a rather cynical view of new features in graphics chips, especially as it takes years before games start fully exploiting them. Everyone is asking which 'features' future games will utilise.

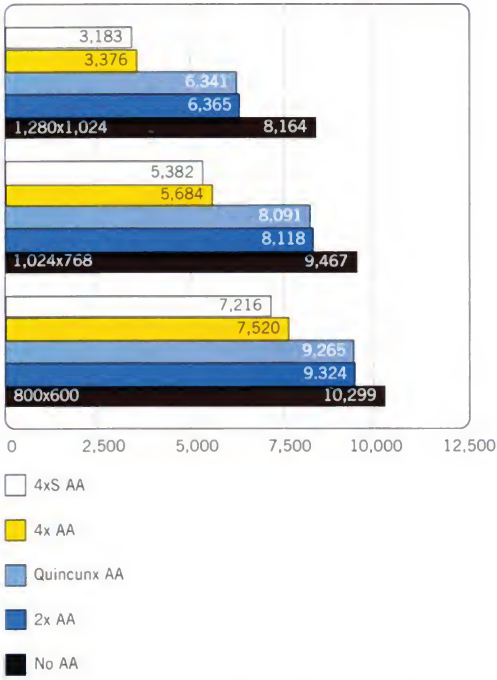
First of all, there's no such thing as a 'feature' per se in 3D. 'Features' or 'effects' are merely ways of accelerating certain set code directly in hardware. Because of this limitation, a developer can only add a 'feature' to its games if it exists in silicon. Features don't help because they are too specific. In essence, they are hacks: they are not the natural way to do things. We can make a game using every DX7 'feature' (from T/L to cube mapping) and it will still look no better than the MechWarrior 2 intro movie. The problem is that hardwired 'features' are simply not flexible and their effects are very, very limited. This is why, even in 2002, few games use cube mapping or EMBM.

Vertex and pixel shaders on the other hand are NOT features. They are more like mini-processors. Instead of giving the developer a 'feature' to work with, these shaders are giving the developer a 'kit' to design their own features. The key is programmability: the developer is in control of what

Quake 3: Arena - AntiAliasing



3DMark2001SE Pro - AntiAliasing



effects it would like to achieve. It's as if DX7 hardwired solutions are stamp templates with preset effects. If you had to draw a picture of wavy water, you'd give the EMBM stamp a press, or if you needed a bump map, you'd have to stamp a bump map template over a character's face – it's so restrictive you feel like in you're in kindergarten. Now with vertex and pixel shaders, you throw away those stamp templates and instead use 128-set colour pencils. Draw any 128 combination to create your own custom effect. Now we are talking! This is the significance of shaders: they are essentially programmable features.

It's important not to think of shaders as more buzz features that developers are not going to implement for two years because they are fundamentally different from what was offered before. It's also interesting to note that the GeForce4 offered no new 3D 'features'. Instead, NVIDIA is optimising its shaders – another sign that shaders will be replacing many features in the future.

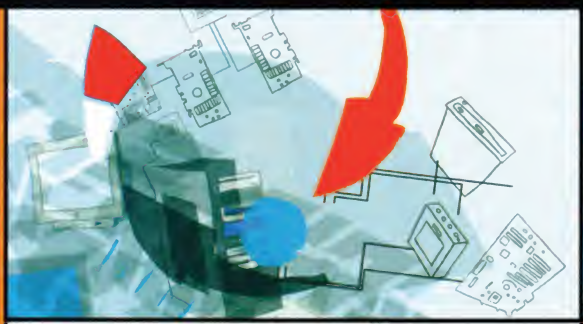
Developers will no longer just choose features to implement, they will soon create their own. The next Doom will abandon lightmaps altogether and use a fully dynamic lit environment where everything is DOT3 bumpmapped. Stencil shadows will be the centre of atmosphere. These will largely use custom shaders. It will also be heavy on mass multi-texturing, featuring more than four textures per pixel. Such scenarios will mean multi-pass rendering on the GeForce4, a definite performance drainer. Basically features are no longer much of a problem given the uni-potent nature of shaders. Instead pipeline limitations such as colour precision and multi-texturing will be the centre of advancement.

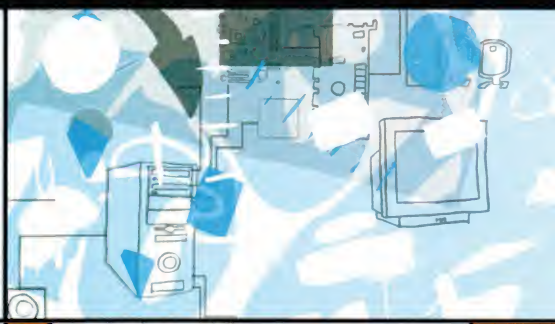
As promising as shaders may be, they still have certain obstacles to overcome. For once, the video card industry is ahead of the API. DirectX 8 and OpenGL1.2 are being engaged (and struggling) to expose all the features in the RADEON 8500 and GeForce4. It has reached a stage where the hardware is a superset of the software. Microsoft has created a hell storm with the naming convention of its shaders as it tries to create a level playing field. Using point releases to expose new features are hardly the way to go. DirectX 9 should see better organisation and unity for the new generation of vertex and pixel shaders in coming hardware. OpenGL on the other hand has exposed a great deal of hardware but mainly through proprietary extensions. The ARB (Architectural Review Board) for OpenGL is pulling hairs out to reach a consensus on which proprietary extensions should be made native for the next revision. Intellectual property rights and inter-company disputes hardly make the job easier. Currently, 3DLabs is spearheading the effort to nail down OpenGL2.0 specifications.

When these industry issues are considered, we can see that NVIDIA has done a fine job with the GeForce4. The integration of a Video Processing Engine and nView shows that NVIDIA will not settle for second place with regards to any functionality. Accuview finally allows anti-aliasing to be used with a minimal performance hit. The performance of the Ti 4600 is untouchable. That said, NVIDIA's naming convention for the GeForce4 MX is very misleading, besides, for a card that does not sport hardware vertex or pixel shaders, it does not even make sense to call it a GeForce3 MX. It's a pity John Carmack has to put it so bluntly: 'Do not buy a GeForce4 MX for DOOM'.

Two versus one

Would James Wang be twice as smart if he had two heads?





You have two choices. Will you double the speed or double the quantity? As intelligent as engineers are, they always end up in the same place – the bottleneck. They always reach a ceiling that is limited either by the laws of physics or economic viability. So in the end, when they can no longer shrink their CPUs, no longer add pipelines to their graphics chips, no longer make bigger screens in any quantity, what is there left to do?

Fortunately for us, we have yet to reach this doomsday, but we can already use the solution as a way of beefing up our machines. Having two of everything can't possibly be bad. Just imagine: two CPUs feeding a dual channel memory interface, two graphics chips working in conjunction to bring 3D to the screen, two monitors doubling our workspace area and multiple hard drives providing sustained peak transfer rates while providing for data protection – it's all possible.

Twice the brains

Computers are very inefficient. If we upgrade we are left with a redundant CPU which does not compute for us. It would make sense if we could just purchase additional CPUs as we need more power, just like RAM or disk drives. The reason why we can't is several fold. One of the main reasons is that most multiple CPU designs use symmetric multi-processing which is expensive to implement and does not give linear scalability. Linear scalability means performance goes up proportionally with the amount of chips you add, but as we've seen, SMP hardly gives a 100% boost in performance even in supported applications. The reason for this is that CPUs are designed to solve a wide variety of problems – from running the operating system to multitasking – and this generalised nature means most of the transistors in a CPU are actually dedicated to solve problems specific to the CPU (branch prediction, L1, L2 caches etc) rather than the problem at hand. In other words, the majority of transistors in a CPU are used as overhead. What this means from a design point of view is, unlike a GPU, you can not get linear increase in performance as you squeeze more transistors into the CPU – the overhead is the limiting factor.

The only real way to make faster CPUs is by increasing clock speed. Having two simply does not return you direct benefit due to the threaded nature of applications. Since consumer level CPUs execute one thread at a time, you can only gain performance if two or more intensive threads are being processed simultaneously by two CPUs. There is another way to achieve thread level parallelism: Symmetrical Multi-threading (SMT).

The beauty of SMT is you don't actually need two CPUs to achieve this. SMT takes advantage of the fact that most of the CPU's execution units are idle when computing a thread. If we have a thread requesting addition, multiplication then storage, in that order, then we gracefully utilise the entire pipeline. However, most applications tend to do the same sort of things over and over again. Office applications may only use the arithmetic unit and occasionally bring up load and store but would not make much use of the FPU. Games would be the reverse, concentrating on FPU and not taking full advantage of the other execution units.

SMT is revolutionary in that it allows you to execute two threads simultaneously within one processor. Intel calls its implementation of SMT Hyper-threading, which actually exists in hardware in all Pentium 4s, although it is currently disabled.

A compatible operating system (Linux, Windows NT, 2000, XP) would view a SMT processor as two distinct CPUs and send threads to each one alternately. The CPU would then attempt to process them simultaneously into the pipeline. In most cases, when the tasks are very random, the CPU can get a fairly decent speed boost. At the last Intel Developer's Forum, Intel demonstrated a Hyper-threading enabled Xeon rendering Maya 30% faster than the identical CPU with HT disabled.

AMD will be taking a much more hardcore approach in symmetrical processing. The 64-bit Sledgehammer (K8) will feature multiple chips on die. This will produce the same effect as having two CPUs – only without the need of a specialised motherboard. Packaging will be a big obstacle when attempting such a perilous engineering task (any good memories with dual chips at all?). Current packaging limitations mean you can only test the integrity of two CPUs after

both cores have being soldered onto the board. If one CPU fails, two are thrown out – not exactly economical. Future packaging technology like Bumpless Build-Up Layer packaging (BBULP) will greatly assist such multi-chip efforts.

Memory & HDD

Given that both system RAM and hard drives are storage systems, scaling them can only give a bandwidth advantage as opposed to computation advantages with CPUs and GPUs. While DDR thrived from the combined factors of high speed, low latency and low cost, it has remained a single channel technology until the arrival of the nForce. The nForce uses dual channel DDR-RAM, offering a not-quite-sane 4.256GB/s of peak system bandwidth. Such is the beauty of dual channel technology. Pity the price tag isn't so pretty. The sad truth is that half of the bandwidth is dedicated to its onboard video. When you plug in a new video card it will not be able to access this bandwidth. NVIDIA therefore included a clever DASP (Dynamic Adaptive Speculative Pre-Processor) to mop up this lucrative bandwidth. The DASP is kind of like a dedicated guessing machine: it'll try to predict what data the CPU is likely to call and cache it to the system memory before hand. While this gives a tangible performance boost, what's really needed is access for the AGP to the much needed system bandwidth. With developers all turning a blind eye on higher ordered surfaces, triangle count can only soar as GPUs gets more powerful. AGP8x and greater access to system memory will be vital in the future.

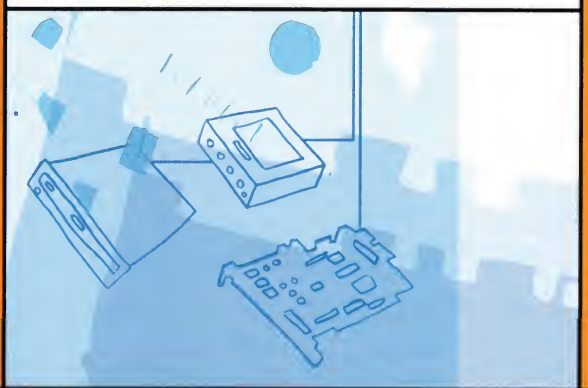
Buy one big hard drive or two smaller ones? Maybe even four tiny ones for that matter. For anything over 40GB, generally two smaller ones are cheaper. Performance wise, there's a lot more to be gained when using a RAID 0 setup. If you're the type to back up your data every week, RAID 1 will end up as your best friend.

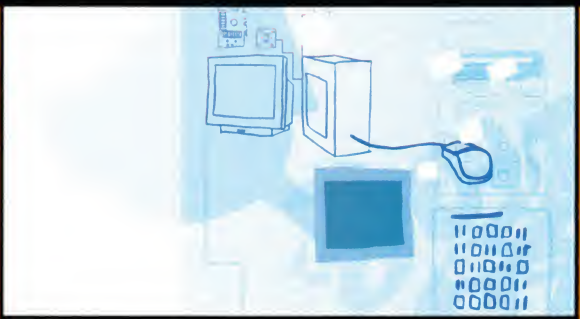
One big drive is simple: one Molex connector, one IDE cable and one partition if you like. The problem is, the HDD is still the biggest bottleneck by far in the home PC. By using simple implementations of RAID, you can gain a fairly significant speed boost in transfer rates as multiple drives work together to bring you that peak transfer rate you always wanted. Demanding applications such as Photoshop will also be much more responsive and even Visual C++ enjoys speedups. However, if you're using NTFS, performance gains will be slimmer.

Data protection is the other option you can exercise but your storage capacity will be halved in RAID 1 mode due to data duplication. You can go the full mile and perform RAID 0+1 for both protection and stripping but this will need four HDD – more than most people's budgets will allow. A simple IDE RAID controller will be enough for most purposes. If speed and protection is what you're after, then scalable storage beats a singular unit.

Double Vision

Ever wondered why monitors seem to max out at 21 inch (51.3cm)? One thing's for sure, the costs involved in making monitors larger grow dramatically as you move past the 21" mark. The cheaper way to gain more desktop space is to use your TV, and develop astigmatism as you wince at the word processor, or set up a dual monitor system. With even high end graphics adaptors featuring dual output, it makes a whole lot of sense to go





with a dual monitor system. For inches per dollar, nothing comes close to a dual monitor setup. For around $1400 you can buy two top of the range 17" Monitors. Given only 16" is visible, you get about 250 square inches of total desktop area, or $5.60/inch – not bad. If you go the full mile and buy yourself a 21" top of the line monitor you're looking to spend a little over $2000. Sure, you'd have insanely high resolutions and three-digit refresh rates, however, you'd only have 192 square inches of desktop area for which you paid a premium of $10.4/inch. The deal is not as clear cut as it seems. Higher resolutions obviously deliver more pixels, which can give more virtual desktop area, but value wise, dual monitor setups win hands down. However, if gaming is what you are concerned with, two monitors will not broaden your point of view. Higher resolutions and faster refresh rates are the way to go and a large monitor should be your preferred choice.

Twice the gibs

As mentioned, CPUs do not offer linear scalability due to their generalised nature and high transistor overhead. GPUs on the other hand are quite the opposite. The majority of transistors in graphics chips are dedicated to 3D and if done correctly, they can give near linear increase in performance as you add more chips.

Multi-chip graphics sub-systems sure sound cool, but since the Voodoo2 no-one has managed to make a successful example of them in the consumer market. 3dfx tried to use different numbers of chips to scale across market segments with the VSA-100, one chip for value and up to 32 chips for high-end visual simulators. This didn't do too badly in the high end but certainly failed to proliferate in the mass consumer market because the cost for this scalability was simply too high.

NVIDIA's model of using the same chip to scale across different market segments by varying core and memory clock speed has proven immensely successful. A GeForce3 Ti500 chip costs the same as a Ti200 but NVIDIA can sell them at a premium to the board producer. Had NVIDIA scaled with two chips for high end, they would have cost twice as much to produce, which is not exactly good business.

Despite all of this, the concept of scalable graphics chips still makes a lot of sense. The main obstacles are architectural. Cost is also a significant issue but two smaller chips can be more economical than one large chip when the large chips start to become too expensive.

Previous implementations by 3dfx and ATI such as Scan Line Interleaving or Alternate Frame Rendering both lacked geometry scaling. Although rendering capability and bandwidth is doubled, geometry performance (transform, lighting and setup) remains the same. The MAXX architecture that uses AFR also suffers input latency as you increase the number of chips, which is limiting its implementation to no more than two chips. Both implementations require additional memory as more chips are added. The extra memory stores duplicated texture data and also consume additional power which may require a Molex or even external power supply. All these technical obstacles gets worse with more chips added and are due to the nature of the traditional 3D renderer. To make multi-chip graphics cards viable, you just need a more suitable architecture.

For traditional renders, the arrival of EDRAM will be a big step in this direction. EDRAM can be thought of as high speed random access memory embedded into the die of the chip. Such designs facilitate an ultra wide memory interface that is eight times wider than our current 128-bit choking bottleneck.

The huge benefit of this method is, as you increase the number of chips, the need for external memory decreases. In fact, with enough chips, external memory is no longer needed. This eliminates all the traces and pins needed to access external memory, which reduces the cost of the board significantly. By assigning different chips to work on alternate view ports, all 3D computations are scaled automatically. There are no more troublesome input latency problems, no external memory to hog power, virtually unlimited scalability and unhealthy amounts of bandwidth just waiting to be consumed.

Two IS better than one – there is no doubt about it – yet the question is still whether 1+1=2. Most solutions will not scale to this simple equation. This is especially true with generalised tasks but specific tasks like the graphics subsystem can immensely benefit from additional chips. Bandwidth will scale automatically with fillrate, eliminating the current misbalance. When most software is written with SMT in mind, we can look forward to a more productive future in scalable central processing. The foot prints of future scalability are already embedded in today's hardware: hyper-threading is in every Pentium 4 and the RADEON 8500 already features a dual chip capable (MAXX) AGP controller. Once architectural limits are broken, scalable systems can be an integral part of our future. Can you wait?

Illustrations: Ben Davis

A Landmark in Pentium® 4 Chipsets

A Match Made in Heaven. Introducing the SiS645 - with new computer"DNA" that delivers an amazing picture - perfect performance.

Silicon Integrated Systems SiS645 chipset, with leading DDR333 memory support and proprietary MuTIOL® technology enabling 533MB/s bandwidth throughput, offers the best in combined speed and quality, creating the ultimate computing experience.

- *Support Intel Pentium® 4 400MHz System Bus*
- *Support DDR333/DDR266/PC133*
- *Support AGP 4X Interface*
- *MuTIOL® Delivering 533MB/s Bandwidth*
- *Integrated Fast Ethernet/Home Networking Controller with MII Interface*
- *Integrated Audio/Modem Controllers with AC'97 Interface*

Silicon Integrated Systems Corp.

www.sis.com

Game not over

Craig Simms delves into the future of the past gaming classics. MK2 on your GeForce3? Why, yes!

The age of the arcade machine is well and truly over. With the recent evacuation of the heavyweights from the industry, the joyous blips and bloops of the local spare coin sinker will soon fade away without much fanfare. The killer? The huge performance explosion of the not-so-humble home PC: suddenly flash graphics, insane special effects and phenomenal sound could be found in your own home, without having to trundle downtown and blow your pocket money on the latest and greatest gaming extravaganzas. The victim of the home gaming revolution, the arcade industry lies on its deathbed. Yet in a cruel twist, the PC has become its greatest saviour of its output – it's just that money doesn't change hands nearly as much.

In a movement that seems to have picked up of late, the games of yore (and even some quite recent) have been preserved via the emulator – a program which mimics the hardware of a given system to fool a game into thinking it's running on its native platform. A dedicated fan-base of collectors, dealers, programmers and gamers have come together to form a society of enthusiastic nostalgists, with an almost rabid devotion to try and emulate everything under the sun in the name of preservation.

It's a noble cause, one reminiscent of several sci-fi films in which the aliens capture the humans along with various other species and add them to a 'zoo' in order to preserve their species forever. Except this time you don't need to feed them, and there's no James T Kirk to foul things up. The games themselves are contained in what's called a ROM (yep, the Read Only Memory type), in essence a binary image that's 'dumped' from a console cartridge or an arcade circuit board ROM chip. While console games often take the form of a single ROM file, arcade games in their totality usually form a ROM set – a grouping of ROMs most commonly distributed within a single zip file.

Of course, by dumping the game, we're talking about the duplication of copyrighted material — and so the question of legality comes into play. However, the legal issues of the emulation world are akin to that of abandonware — a grey area which exists under the credo that the companies whose games are being emulated are not making money from them any more, and so despite copyright infringement, no real damage is being done by distributing said games free of charge. At the most it could be classified as piracy, but most companies tend not to care since the games are no longer garnering a profit. Of course, in the cases of the PlayStation, Nintendo 64 and Gameboy Advance, the associated companies of these still current machines have rightfully protected their properties doggedly — most notably Sony, who did just about everything possible to shut down the notorious Bleem! PlayStation emulator a few years back (and until recently, I might add, failed).

One of the beauties of the emulation scene is being able to get games that for one reason or another were never released locally. Predictably, without instruction booklets or marquees it takes a while to figure some out, especially those which also happen to be in Japanese. And there's the bonus of being able to access (in emulated form) those ever so useful dipswitches and buttons that were always locked away in the cabinets which do nifty things like change the game difficulty, rotate the screen, and open up the possibility of unlimited credits!

By far the most wide reaching emulation project would have to be MAME (Multiple Arcade Machine Emulator), with support for over 3000 ROM sets, and almost 2000 unique games, covering a huge slab from Midway's Gun Fight (1975) right through to SNK's King of Fighters '99 (1999). With so many ROM sets, the hard drive space taken has the potential to bloat considerably, and to combat this the ROMs can be split into a parent/clone relationship.

A what? Take for instance, the several different versions and clones of Pacman. For the most part, a lot of files required by the clones are identical to the original game (parent). Rather than waste space and include these common files in both ROM sets, the clones only contain the files that are different from the parent. When executing the clone ROM, MAME checks first the clone for the files required and if any are missing (namely the common files) it then checks for those files within the parent zip, making the whole process more hard drive friendly. Depending on your

Console me

Arcade games aren't the only thing to have been emulated – console systems have also been given the treatment. From the old Colecovision right up to the Nintendo 64, a slather of systems have been preserved for future generations, with varying degrees of success. Most of the older emulated systems work on the lowest level possible, emulating the chips themselves – that is, as far as the game is aware it is running on a Super Nintendo – whereas the newer PlayStation and N64 emulators work off the principle of only giving the game what it needs. The latter is an extremely inefficient way of working, as every game needs to be dealt with on a separate basis, support being added to the emulator version by version, rather than just working towards a single engine that can run any new game that may be dumped.

Mortal Kombat 2. The greatest fighting game of all time, apart from Soul Calibur.

Pengo was the Arctic Silver of Mr Do. Any resemblance to Linux is purely coincidental.

Parodius. The greatest side-scrolling shooter ever. Possibly the greatest game ever, too.

source, a lot of ROM sets won't come in 'merged' sets like this, but an automated ROM manager such as Romcenter or CLRMame Pro will do the job for you quickly and easily.

However, the world doesn't stop at ROMs. Several MAME front ends/distributions/ports can display pictures of marquees, flyers, arcade cabinets, artwork, control panels, control panel layouts, icons and screenshots for each individual game to allow for a more involving experience and accurate history lesson. There are files available that will tell you the history of and interesting facts about a given game, the current bugs in the game driver which need to be fixed to attain perfect emulation, highscore lists, the category the game falls under and even files that enable cheats(!) in the games. Welcome to the world of the fanatic. It's freaky, it's unnatural, it's great and we love it. It's a proper community, with more than a hundred code monkeys contributing to the MAME cause, thanks to the strength of the open source license. Anyone can submit a driver, anyone can suggest a fix, anyone can add code and if it's not accepted into the 'official' code, you can always compile your own. It's a methodology which has found a fan base at least as passionate as that as the Linux moguls. Unfortunately most other emulators haven't followed suit, especially the console emulators usually only written by a small team, or in some instances a single person — and the source is kept closed. Consequently, each emulator has varying feature sets and often you will need a few different emulators just to run different games that were intended for the same system. Generally, the older the console, the more likely it is to have been accurately emulated. It's only a matter of time.

Going the distance

All this gaming isn't going to be friendly to your keyboard – the combinations of buttons required to execute moves, and especially the addition of a second player, is going to jam up your keyboard interrupts faster than an Athlon decodes a JPEG. Joypads are okay, but for the full arcade experience you really should get a full control panel. Beasts such as the Hanaho hotrod, OzStick Ultimate and the RomboxX are sure to satiate most gamers' needs, but command a hefty price, going for $385, $239.95 and $770 respectively. And that's not including shipping. Of course, you can always build your own (and if you're intending on including a spinner or trackball, it may be necessary) – there are several resources on the net dedicated to such a venture – just don't expect it to be cheaper than buying a ready made kit.

Then there are those special freaks who have to take it one step further: enter the arcade PC. Picture a motherboard and other various components attached to the side of an arcade cabinet, wired up to the custom made control panel and 27" monitor for the most authentic arcade experience yet – except this time you've got over 3000 games on the one

machine – and if you're clever enough, you can even splice in some old console controllers and have it as a multiplatform box with thousands of more games. You'll have to sacrifice a spare PC to do so, but keep in mind you don't have to relegate it to only one purpose for the rest of its life — in its idle time it could be an MP3 jukebox. Once again, it's a project that allows varying degrees of interaction, whether completely building and wiring the cabinet from scratch, gutting and converting an old box or buying the ready made Hanaho Arcade PC to do the job.

The day of the arcade may long be over, but the past's future is looking very bright indeed. Emulators continue to grow in complexity and accuracy, as more and more games of the past are preserved through the PC. It's a wonderful trend that hearkens us back to our untroubled childhoods, when the most complex issue we had to deal with was how to figure out the fatality to remove someone's spine using the mighty Sub Zero in Mortal Kombat.

The arcade is dead. Long live the arcade.

Emulated?

- Acorn Z88
- Amstrad/Schneider CPC
- Amstrad NC100/NC200
- Amstrad PCW8256/8512/9512/9512+/10
- Amstrad PCW16
- APF Imagination Machine/M-1000
- Apple IIc/IIe
- Apple Lisa
- Apple Macintosh 512ke/Plus/XL
- Aquarius
- Atari 400
- Atari 800
- Atari 2600
- Atari 5200
- Atari 7800
- Atari 8bit
- Atari Lynx
- Atari Jaguar
- Atari ST
- Atom
- Bally Professional Arcade
- Bandai Wonderswan
- BBC Micro Series
- CDI
- Colecovision
- Coleco Adam
- Commodore/MOS Kim-1
- Commodore 16/+4/364
- Commodore 64/65/128
- Commodore Amiga
- Commodore MAX
- Commodore PET
- Commodore VIC20/VC20
- DEC PDP-1
- EACA Colour Genie 2000
- Emerson Arcadia 2001
- Enterprise 128
- Entex Adventurevision
- ETI Dream
- Fairchild Channel F
- Galaksija
- GCE Vectrex
- Kaypro IIx
- KC Compact
- Laser xxx Series
- Magnavox Odyssey
- Magnavox Odyssey 2
- Mattel Intellivision
- MB Microvision
- Memotech MTX512
- MSX
- Nascom 1 & 2
- NEC TG 16 / PC Engine
- Neo Geo
- Neo Geo Pocket
- Nintendo 64
- Nintendo Entertainment System
- Nintendo Game Boy
- Nintendo Game Boy Color
- Nintendo Game Boy Advance
- Nintendo Virtual Boy
- Oric 1
- Oric Atmos
- Oric Telestrat
- Palladium VCG
- PC-8801
- PC-98
- RCA Cosmac VIP
- RCA Studio II
- Sega 32x
- Sega CD/Mega CD
- Sega Dreamcast
- Sega Game Gear
- Sega Genesis/ Mega Drive
- Sega Master System
- Sega Saturn
- Super Nintendo Entertainment System
- Super System 1/2/3
- SG-1000
- SC-3000
- Sharp X1
- Sharp Pocket Computer 1350/1401
- Sinclair ZX Spectrum
- Sony PlayStation
- Super Nintendo
- Tandy/Radio Shack Color Computer (CoCo)
- Tandy/Radio Shack TRS80
- Tandy 1000HX
- Team Concept Comquest Plus
- Thomson MO5
- Texas Instruments TI 99 / TI 99 4a
- Watara Supervision
- Many Arcade Games & Pinball Tables

Arcade Terminology

Attract Mode
When the game is not being played, it usually switches to attract mode. This is used to entice players, showing parts of the game, introducing a story, or even demonstrating certain moves.

Bezel
The glass separating the player from the monitor; often decorated with silk-screened artwork.

Cabinet
The wooden box housing the screen, controls and circuit board; it can either be an upright (full sized, complete with side art), cabaret (the non descript wooden ones often found in fish and chip stores), cocktail (the ones that look like coffee tables) or a custom made cabinet.

Control Panel Overlay
Silk-screened game art decal over the control panel.

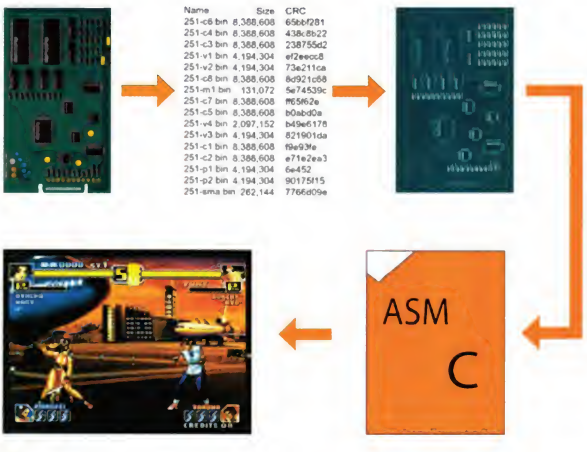
Flyer
The poster that was distributed by the game company to advertise the game.

Marquee
The banner featured at the top of most arcade cabinets, which identifies what the game is and is usually backlit.

Raster Monitor
Similar to a TV, used for most arcade games from Pacman to Mortal Kombat.

Sideart
The art on the side of a cabinet.

Vector Monitor
Draws images using x/y coordinates, used for games such as Asteroids and Tempest.



ⓘ The pathway of the original ROM image to its final emulated state.

Link me

MAME Official Homepage
www.mame.net

Flyers, Cabinets, Icons, Screenshots
www.classicgaming.com/mame32qa
www.arcadeflyers.com
http://crashtest.retrogames.com
www.klov.com

Marquees
http://emam.mameworld.net

Emuloader Homepage — brilliant MAME frontend.
www.mameworld.net/emuloader

MAMEWorld — all you need to know. Link heaven.
www.mameworld.net

RomCenter — the best MAME ROM manager.
www.romcenter.com

The Good Tools — the best console ROM managers.
www.vg-network.com/goodtools.phtml

Building Your Own Arcade Controls
www.arcadecontrols.com/arcade.htm
www.mameworld.net/emuadvice/keyhack2.html
www.oscarcontrols.com/

Converting Console Control Pads
http://snespad.emulationworld.com/welcome.html
www.alltechbox.com/pc/pc006_pg01_eng.php3

Control Panels
www.x-arcade.com
http://home.iprimus.com.au/ozstick
http://hanaho.com/products/HotRodJoystick
www.slikstik.com

Emulation Sites
www.classicgaming.com
www.retrogames.com
www.emuunlim.com
www.vg-network.com
www.arcadeathome.com
www.zophar.net
www.emuunlim.com
http://linuxemu.retrofaction.com

Other Emulators
Pinball
www.pinmame.com
www.randydavis.com/vp

Arcade
www.impactemu.com
www.rainemu.com
http://kawaks.retrogames.com
http://kingkof.tripod.com/snk_history
www.namco.com/usa_index.html

Subscribe and be a winner!

Become a fully fledged Atomican, save a few bucks – 45% off newsstand price - and score mega convenience at the same time.

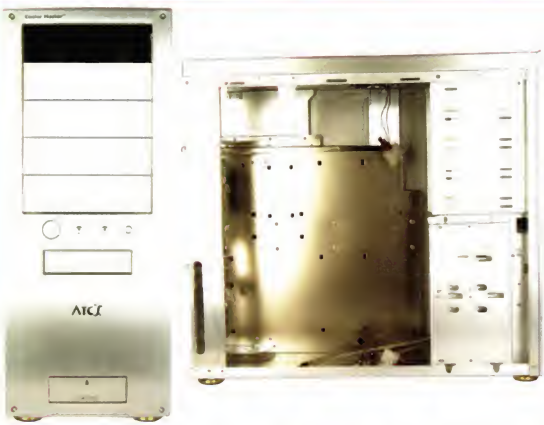
Why rip yourself off any more? With savings as big as these, the only option is to subscribe. And if you sign up within two hours of reading this advert, we'll ship a free set of steak knives out to you. Well, not really, but we'd like to.

MSI GeForce4 MX 460

Tell John Carmack to stick it up his buffer and cache it. The GeForce4 MX is a tasty performer, even thought it's supposedly NVIDIA's new budget chipset, and would surely complement your machine. As you've already seen in Atomic, this video card is still schtonkingly fast, with the grunt to run games at resolutions that will make your monitor scream in pain.

Plus, you get to tell your friends you've got a GeForce4, making them weep tears of blood in envy. Thanks bigtime to MSI for providing this neato prize - if it wasn't for them we'd be giving you the leftovers from last weeks Turkish pizza binge. As we always say at Atomic – 'if it's MSI, it's not a truck'.

On a final note, this video card is red, making it go faster and suiting the angry mood most gamers are in.



Cooler Master ATC-101-SX4 Aluminium Case

As reviewed and loved in Atomic 14! Australia IT donated this lovely prize, so go to www.australiait.com.au and buy something expensive.

The ATC cases are the cream of the crop and feature:

Front standard dual USB port for easy access;

Excellent ventilation of the motherboard and HDD drive courtesy of several case fans;

Drawer-style motherboard tray for simple installation and easy maintenance;

Tool-free assembly/disassembly for quick and convenient maintenance or upgrades;

Full EMI shielding to protect user from harmful electronic emissions;

Highly flexible power supply options of 300W or 400W;

Entire case constructed of Aluminum, an exceptional thermal conductor, to conduct and disperse heat like a huge heat sink.

NEW: Gift subscription now available online. Give the gift of lurve!

1 yr for $49 save 30% 2 yrs for $80 save 45%

If you've read our forums, you'll probably notice that every month our subscribers whip themselves into a rabid frenzy when their subscriptions arrive. We've had several complaints from Australia Post about Atomic readers knocking postmen off their little red scooters to get their subscription copies 3.6 minutes earlier than if they'd waited for it to be placed into their letterbox. If you'd like to join this crew of hardcore Atomicans, and save yourself a MASSIVE 30% off the shelf price, you simply must subscribe. You also get to beat up postmen.

We've also got a new deal in the works, where you can save an even more GIGANTIC 45% off the cover price. All you need to do is subscribe for two years. Because of this saving, none of the Atomic staff can now afford to eat, pay rent or Internet access fees, but we're managing to subsist purely on the love of Atomic.

Trust us, once you've subscribed you'll be wondering why you didn't do it sooner.

New: Gift subscriptions now available online @ www.atomicmpc.com.au & www.atomicmpc.com.nz

Issue 13 subscription winner: Hercules TFT, Mr D Suen, Peak Hill NSW

Terms and Conditions of Entry. 1. The promoter is AJB Publishing Pty Ltd (ACN 083 063 914) of Unit 2-5/44-70 Rosehill Street, Redfern NSW 2016. Promotion period is from 9.00am on 20.03.02 until 12.00pm on 17.04.02. 2. Entry is open to residents of Australia and New Zealand. Management and employees of AJB Publishing Pty Ltd and their immediate families, and any advertising, marketing or promotional firms associated with this promotion are not eligible to enter. 3. Enter by posting or emailing forms to AJB Publishing Pty Ltd. 4. The draw will be held at the offices of AJB Publishing Pty Ltd at 5.00pm on 17.04.02. Winners will be notified by mail and published in Atomic 17. 5. The prizes are not transferable or exchangeable and cannot be taken as cash. 6. The judges' decision is final and no correspondence will be entered into. 7. The promoter reserves the right to publish the winner's name and suburb for promotional purposes. 8. All entries will become the property of AJB Publishing Pty Ltd.

WHY YES! I would love to adopt Atomic Magazine as part of my immediate family! Please find enclosed my dowry:

- ☐ Australia
  - ☐ 1 year (12 issues) $49
  - ☐ 2 years (24 issues) $80
- ☐ New Zealand
  - ☐ 1 year (12 issues) $NZ65
  - ☐ 2 years (24 issues) $NZ110

Email: _____

Surname: Mr/Mrs/Miss/Ms _____

First name: _____

Address: _____

Country: _____ Postcode: _____

Phone: ( ) _____ Fax: ( ) _____

✔ Please tick method of payment

☐ Cheque/Money Order

Make payable to Atomic Magazine and post with this coupon to:
Atomic, PO Box 275, Beaconsfield NSW 2014, or
fax (credit card only) to (02) 9817 4955.

☐ Bankcard ☐ MasterCard ☐ Visa ☐ AMEX

Expiry Date: ☐☐ / ☐☐

Card No.: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Cardholder's name: _____

Signature: _____

Date: _____

Atomic 15

NETWORK WALKMAN

SONY NETWOR MAN

2

SONY

SONY NET RK WALKMAN

02:59

03:00

Pay Per Play

This month Bennett Ring looks at the costs associated with multiplayer gaming, and more specifically, who's going to pay them.

Multiplayer gaming has risen immensely in popularity over the last couple of years as more and more home PCs have patched into the Net. In fact, judging by how many developers are creating multiplayer games of one sort or the other, it actually looks set to surpass single player gaming as the gamer's favourite way to play. Even the Xbox is trying to jump onto the multiplayer bandwagon.

And why the hell not? Current computer technology simply can't compare to the human brain when it comes to having the huge amounts of processing power necessary to develop strategies or tactics. Even if character AI did advance to the point of being as cunning, tricky and down right dirty as a human player, the knowledge that you've just caned a real life human being will always be infinitely more satisfying than beating some programmer's AI algorithm. Taking down multiple real life opponents simultaneously can be one of the most satisfying experiences known to gamekind – if you've ever grenaded four opponents at once you'll know exactly what I'm talking about. The respect from the other players in a game when you pull off a manoeuvre like this will have you feeling good about yourself for the rest of the day. Hell, I can still vividly remember a single shot I fired in a game of Counterstrike almost two years ago. Why do I remember it so clearly to this day? Because I killed four players at once with a single round from my AWP sniper rifle – I shit you not. Granted, two of them were team mates, but I still slaughtered four real live human beings with one shot. Even just writing about it now brings a grin to my face.

Then there's the camaraderie that is created when you play as part of a team. I've easily made more lasting friends on the virtual battleground than I ever did when out clubbing or pubbing. But as multiplayer gaming becomes ever more popular, a huge problem is beginning to crop up, and it's not cheating.

For every multiplayer game, a server is needed. This server program needs to be hosted on a decent PC chock full of RAM with a Net connection that makes even an Optus@Home cable user's connection look like a piddly dial up modem. We're talking T1 connections or better, and these cost big bucks. There isn't some magical organisation that funds these services, so it's currently left to ISPs to foot the bill.

As a consequence, we're beginning to see a chronic shortage of servers within Australia. Finding a local server for new multiplayer games, with the exception of a couple of big name games, usually turns up less than a handful of servers within the whole of Australia. Alien versus Predator and MOHAA are two prime examples. They've both sold very well in Australia, but the grand total of two servers for both games within our country only provides enough room for 32 players at a time. Considering that both titles have sold in the thousands, it's easy to spot the shortfall in server support. Even servers for the bigger games such as Counterstrike and Return To Castle Wolfenstein are showing signs of chronic over population, with long waits to find an empty spot becoming a regular occurrence.

The problem is only going to get worse as more people join the multiplayer revolution. Unfortunately there seems to be only one solution – pay per play. It's been trialled in the past with the Wireplay service, but flunked due to a lack of subscribers. However, I believe the time is near that this type of service will finally attract enough customers to be a profitable proposition. There are rumours going around that Microsoft will use a multiplayer subscriber model for the Xbox, and it will be one of the main revenue streams the company will be counting on to turn profit from its new wonder console. I can't verify this, as the Xbox's online strategy is as closely a guarded secret as the Queen's favourite sexual positions, but it makes sense.

I for one wouldn't mind paying ten to twenty dollars per month to ensure I had access to lag free servers that aren't chock full 98% of the time. It's not going to be easy to convince most PC gamers, the majority of which believe anything on the Net should be totally free, but a nice analogy is to compare it to playing basketball. You have to pay to use the basketball courts, but at least you get to play on a polished professional court as opposed to a decrepit backlot riddled with used syringes. Why should gaming be any different?

The other option, which is no doubt preferable to us cheapskate gamers, is to wait until we've all got 1.5Mbps connections at home, with PCs powerful enough to host servers in the background while we go about our normal daily tasks. Unfortunately this kind of technology is quite a way off in Australia, and could incur high costs if you pay for internet access on a per MB basis.

I'm sure this rant is going to spark a lot of debate – it sure has in the Atomic offices. If you'd like to have your say, head over to the general forums at www.atomicmpc.com.au and hit the Pay Per Play thread. ○

Atomic benchmarks

The Labs method to Atomic madness.

Here at Atomic it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking, and this is something we take very seriously in the Atomic Labs.

SYSmark2001

SYSmark is a product of the collaboration between industry group BAPCo (www.bapco.com) and MadOnion.com (www.madonion.com). It is the first of the next-generation application benchmarks and is designed to more accurately replicate the day-to-day workload that a system is subjected to. The benchmark focuses on Internet Content Creation and Office Productivity tasks in order to generate a final rating.

SiSoftware Sandra 2002 Professional

Sandra, from SiSoftware (www.sisoftware.co.uk), is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specifications and settings of a system, by polling each component's built-in firmware or BIOS. Sandra also features a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk. It also features a burn-in wizard for stress-testing overclocked systems.

3DMark2000 Pro

3DMark2000 Pro from MadOnion.com is a powerful benchmark for testing Direct3D performance, and is the successor to the popular 3DMark99 MAX. Although it is a synthetic benchmark, it uses the advanced MAX-FX 3D engine from Max Payne, which is representative of the latest in Direct3D performance and technology.

3DMark2001 Pro

3DMark2001 Pro from MadOnion.com is the next progression of the popular benchmark utility. It also uses the MAX-FX engine and heavily emphasises DirectX 8.0 functions, including programmable shaders. The results are not comparable with results from 3DMark2000 Pro.

HSF testing

To test HSFs, we use our Athlon XP test bed, which uses an internal temperature diode. SiSoft Sandra 2002 is run in looping burn in mode, with both CPU tests selected for 30 minutes before the load temperature is recorded. The CPU is then left to idle for 30 minutes before the idle temperature is taken.

Quake 3: Arena AtomicMPC Demo

Quake 3: Arena (Q3A), from id Software, is the very popular first person shooter representing the latest in OpenGL gaming technology. Q3A has a built-in benchmarking utility and built-in demos that can test graphics card performance. These demos are fairly simplistic, and are not representative of the worst conditions that the game can offer to a graphics card. So we developed our own AtomicMPC Demo that pushes the hardware as far as possible.

Other benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, or a particular facet of 3D like T&L or SSE. For these specific purposes we can draw on a vast number of applications, games and dedicated benchmarks such as CD Speed 99, DisplayMate, Dronez, MDK2, Adaptec ThreadMark, or Serious Sam. Whenever we use one of these special benchmarks we will outline the nature of the tests, the testing procedures and any settings we use.

Atomic testbench specs

Both systems are running Windows XP Professional with DirectX 8.0a, as well as the latest official NVIDIA drivers.

- **AMD Athlon XP 1800+ system – ASUS A7V266-E motherboard (supplied by CASSA, www.cassa.com.au)**
- **Intel Pentium 4 2GHz – Abit TH7 RAID motherboard (supplied by ABIT, www.abit.com.au)**

Common components

- **Samsung 256MB PC2100 DDR-RAM (supplied by CASSA)**
- **Samsung 256MB PC800 RD-RAM (supplied by CASSA)**
- **Hercules Prophet II GTS 32MB (supplied by Guillemot, http://au.hercules.com)**
- **20GB Ultra DMA/100 7,200rpm hard disk drive**
- **Hercules Prophet II GTS 32MB (Supplied by Guillemot, www.hercules.com)**
- **Sound Blaster Live! Player (Supplied by Creative Labs Australia, www.creaf.com)**
- **ASUS 52X CD-ROM (supplied by CASSA)**
- **Belkin PCI Firewire card (supplied by Belkin, www.belkin.com.au)**
- **Belkin PCI USB 2.0 card (supplied by Belkin)**

Benchmark settings

3DMark2000 Pro

- **1,024 x 768, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,024 x 768, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**

Quake 3: Arena AtomicMPC Demo

All tests use Quake 3 1.27g

- **CPU: 320 x 240, maximum geometry detail, minimum graphics settings, high sound quality**
- **Graphics cards: 640 x 480, normal quality graphics settings, high sound quality**
- **1,024 x 768, maximum graphics settings, high sound quality**
- **1,600 x 1,200, maximum graphics settings, high sound quality**

ARE YOU READY FOR 3GH SPEED?

Then you are ready for Subzero with Vapochill

THIS IS THE MOST VERSATILE SUB-ZERO COOLING SYSTEM FOR PC-OWNERS EVER MADE !!!

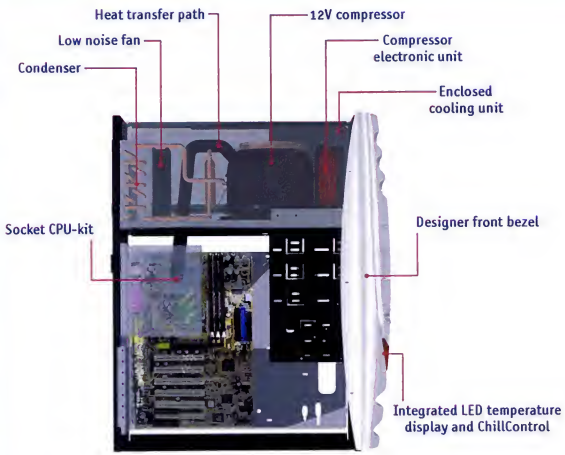
***Noise level is down to 35db!**

***Average temp cooling -12deg C!**

***Available for All Intel P4,P3 & AMDAthlon CPU's!**

vapochill

From 1st to 7th Generation in one leap



CHILL OUT TODAY!

The easy installation procedure makes it ideal and suitable for almost any kind of socket-based mother-boards- in others words, you will get MAXIMUM flexibility in choice of hard-ware at aMINIMUM of cost.

AUSTRALIA PACIFIC DISTRIBUTOR.
CDT TECHNOLOGY Pty. Ltd
Unit 9 27-23 thornton Crs
Mitcham 3132
Victoria Australia
+61 3 9874 1309
+61 3 9874 0035
www.cdt.cam.au
www.vapochill.com
Dealer inquries Welcome.

PHONE NOW 039874-9874

www.cdt.com.au

Gainward 600/TV Golden Sample

The GeForce4 line gets more confusing. John Gillooly didn't think it could happen.

After years of NVIDIA keeping a tight reign on the core and memory speed of cards that use its chipsets, the dam appears to have broken with the release of the GeForce4 series. One manufacturer that has traditionally offered higher clocked cards is Gainward, with its Golden Sample line of products.

The Gainward GeForce4 PowerPack! Pro 600/TV Golden Sample is part of one of the most dangerously named series of products to come past the Atomic labs in a while. This card uses the GeForce4 MX440 chipset, even though the name makes no mention of it. In fact, the Gainward naming convention calls the MX cards Pro and the completely different Ti cards Ultra. Two completely different architectures labeled as the same will cause a lot of confusion, and this is something to keep an eye on when looking for a GeForce4 card.

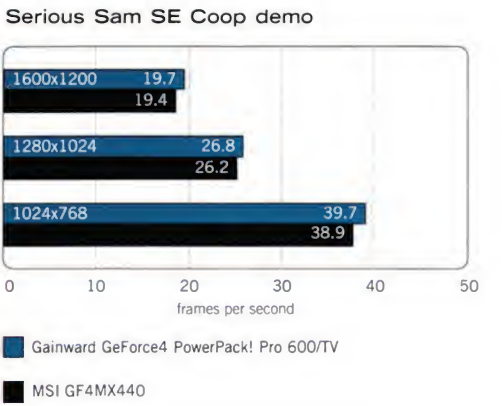
At the heart of the issue is the fact that the MX440 chipset is essentially an updated GeForce2 chipset – though admittedly much more powerful. This is not a card to get if you crave Pixel Shaders, but for the vast majority of people, this is still not an issue. For the price though, the chipset is unbeatable.

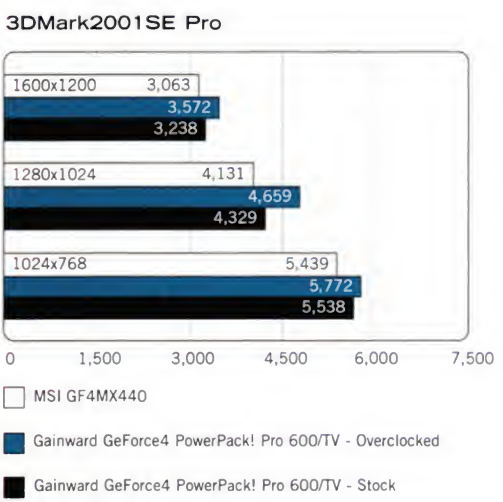
Gainward prides itself on the use of high quality, fast RAM on its cards. With the GeForce4 series NVIDIA has introduced its Lightspeed Memory Architecture II (LMA II), which provides the MX with two independent 64-bit memory controllers and a swag of other tweaks to maximize bandwidth utilization.

We lined the PowerPack! Pro 600/TV up against the MSI GF4 MX440 on our Athlon XP testbench, using the leaked 27.20 Detonator drivers. The cards were tested using 3DMark2001SE Pro and the Serious Sam Second Encounter Demo, using Quality settings under OpenGL. In Serious Sam SE, the performance difference is less than one frame per second, but the overall performance is still impressive for a budget card.

To spice up the 3DMark2001SE Pro tests we tested Gainward's other claim to fame, overclockability. Using the supplied EXPERTool overclocking utility we cranked the core up to 300MHz from the 275MHz default and the memory up to 475MHz, a decent gain over the 400MHz default speed.

This delivered a 5% performance gain at 1,024x768 but rose to 10% at 1,600 x 1,200, which is not huge, but when had anyone complained about free performance? Again at stock speeds there was no significant difference between the MSI GF4MX440 and the Gainward PowerPack! Pro 600/TV.





When you combine the performance, TV-Out and snazzy red HSF/PCB combo Gainward have a tasty solution. If you are after fast gaming for the near future, and don't have the wads of cash to spend on a high end model, then the GeForce4 MX is worthy of a look. But if you want a card that will run the next generation (whenever that may be) of Pixel Shaded games to their full potential, then it is probably worth going for a GeForce3, GeForce4 Ti or RADEON 8500 level card instead.

SPECIFICATIONS

NVIDIA GeForce4 MX440, 64MB DDR RAM, TV-Out, EXPERTool overclocking utility

Web site: Gainward www.gainward.com

Supplier: Hallmark Computers www.hallmark.com.au

Phone: (03) 9540 8555 **Price:** $315

atomic 8/10

Handspring Treo

This mobile phone/PDA hybrid is a lot more than a vibrating Web browser says Simon Peppercorn.

This is the first mobile phone device reviewed by Atomic. We chose to do this one because it's too darn funky to pass up. On first appearances, the Handspring Treo resembles an oversized flip phone with a clear cover, but there is much more to this device than a standard PDA or mobile phone.

Handspring is one of the leading players in handheld devices, and is well known for its Visor range of handheld computers.

The best way to describe the Handspring Treo is as a PDA that can be used as a mobile phone and wireless Internet device. Even though the Treo uses the Palm OS 3.5, it offers a lot more in terms of overall design and functionality, such as a built in Web-browser and POP3 email client.

The unit is capable of running all applications that have been developed for the Palm OS and provides you with a phone book, to do list, calculator, world time and so on. Palm OS is also fully compatible with Microsoft Outlook.

Designed by Jeff Hawkins, the man who invented the Palm Pilot and the Handspring Visor, there are two models of the Treo: The Treo 180, which uses a built in modified QWERTY keyboard; and the Treo 180g, which relies on Graffiti-style handwriting for input of text.

The Treo is lightweight, weighing in at only 153g, but is rugged and sturdy in its design. The flip cover has a clear window, so caller details, alarms, SMSes and so on can be viewed without opening and activating the phone. When the unit is opened, however, it instantly displays your speed dial list, which can contain up to 50 entries. Just press the speed-dial button of the number or name of the person you wish to dial, and the phone starts dialing. This feature is so handy and simple to use, it is surprising that it had not been used by mobile phones years ago. You can use the supplied stylus, or for simple dialing of numbers, the on-screen phone keypad is large enough to punch numbers in with your thumb, making one handed usage possible, without being clumsy.

The keyboard is another matter. The keys themselves are quite small, and two-handed operation is required to type many of the available characters or numbers. However at the base of the unit are four buttons, which provide one-touch access to the phone book, organiser, Web browser and SMS functions.

The Handspring Blazer is the built in Web browser and is basic in its abilities: for example, it doesn't support frames or Java, however it does support 128-bit encryption, cookies and bookmarks, as well as various markup languages such as WAP, xHTML, and cHTML.

We first saw the Blazer browser in the Handspring VisorPhone, but it can be downloaded and installed (for a price) into any device running Palm OS 3.1 or greater. The browsing experience takes a little getting used to as it condenses the contents of Web pages to fit as much on the screen as is readable. You can't download files directly from the Internet with the Blazer browser: downloading applications for the Treo from the Internet would need to be done from your PC and then installed via the HotSync cable. You can even download instant messaging applications like Yahoo! Messenger for online chatting with your pals, but as you'll be playing mobile call rates, this is not the best idea. In order to use the Web browser and email, you will need your own existing dial-up Internet account. Cable users will luck out in this area.

The treo is supplied with 16MB of memory and the processor is a standard 33MHz Dragonball Vz. Although colour would be nice (and drive the price well out of reach), the backlit monochrome display with 16 shades of grey is clean and sharp. The refresh rate, however, is quite low, with noticeable flickering of the screen. The Lithium Ion battery is perhaps a little underpowered, providing around 2.5 hours talk and 60 hours standby time.

Instead of the typical cradle type devices usually associated with docking a PDA with PC, the Treo uses a USB HotSync cable as standard. For older operating systems without USB support, a serial cable can be ordered. Being a dual-band world phone, it supports both the GSM 900 and GSM 1900 networks. When using the phone, the sounds were clear and crisp.

At the time of writing, we weren't able to determine whether the Treo would be available anywhere other than a mobile phone dealer.

SPECIFICATIONS

GSM phone; 33MHz Dragonball VZ processor; 16MB memory; Palm OS 3.5.2H; monochrome display
Web site: www.handspring.com
Supplier: Brightpoint Aus Pty Ltd
Phone: Brightpoint Aus Pty Ltd 1300 765 005 **Price:** $1,399

atomic 8/10

Sony Network Walkman

If Sony knows how to do one thing, it's how to create sexy designer gear. Oh yeah, Sony also knows how to charge exorbitant prices for these pieces of pseudo art. So is it any surprise that the new Network Walkman is such a spiffy looking MP3 player? In fact, we'd go as far as to say that if you wore this thing around your neck, the way Sony intends, you're going to have members of the opposite sex throwing their recently-removed underwear at you in the street.

You should never judge a book by a cover, nor an MP3 player by its silver plastic exoskeleton. If you did, you could be forgiven for thinking the Network Walkman is a brilliant piece of kit. Alas, after thoroughly examining the device, the truth is revealed: this is yet another case of a Celeron dressed up as a P4. In terms of sound quality, this MP3 player compares well to the rest, but it's still a long way off the oomph delivered by the best of the bunch, which also happen to be considerably cheaper. The Network Walkman is also let down by the one thing that gives it pulling power: the case might be sexy but it is made primarily of plastic, and it feels fragile.

The software included to download MP3s from your PC to the player has to take the cake for being the most ill conceived piece of rubbish we've ever had the misfortune of getting frustrated with. 101 other applications out there do the job quickly and easily, so we're not sure how Sony managed to screw the pooch so badly on this one. Perhaps it's due to the confusing copy protection schemes incorporated into the software, one of which stops you downloading songs from the MP3 player to other PCs.

None of this will matter to those who end up paying the hefty $899 asking price. Owning one of these MP3 players is akin to owning Louis Vuitton luggage, or a Mercedes Benz vehicle. It's all about image, and that's probably the only thing this MP3 player has got going in its favour.

SPECIFICATIONS

64MB, USB for downloading, included recargable battery, confusing copy protection scheme

Web site: Sony Australia www.sony.com.au
Supplier: Sony Australia www.sony.com.au
Phone: Sony 1300 137 669 **Price:** $899

atomic 6.5/10

iCute4 3200 and 4200

Aluminium is the new black. We are still unsure as to whether this is a conspiracy started by the world's Bauxite mining community or just a byproduct of people loving shiny silver things. The latest component to get the full Aluminium treatment is the humble power supply, with the iCute4 series.

Ignoring the wacky name for a moment, the iCute 4 PSUs come in two flavours: the 320W 3200 and the 420W 4200. Both models sport dual 80mm fans, one internal and one mounted externally on the back of the unit. This does help case cooling, however it means that on some cases there may be difficulty with rear clearance when mounting the PSU.

Each unit sports six molex connectors as well as the necessary triumvirate of ATX, ATX12V and auxiliary connectors needed to feed a power cable hungry Pentium 4 system. The 4200 also has a connector for monitoring the rear fan speed via a motherboard header. The ATX cable is 50cm long, which should provide plenty of leeway in the tricky cable stretching game that often marks the installation of a new system.

All of this is fairly standard fare for PSUs these days. The iCute PSUs distinguish themselves in the looks department and in their quiet operation. Despite sporting dual fans, these units are almost silent, which won't be too much of an issue if they are sitting above a howling 7200RPM CPU cooler, but is a big bonus for those with quieter cases.

The other main feature of the iCute series is looks: rather than the boxy look that marks most PSUs on the market, iCute units have rounded edges, and come in two colours. By far the most popular will be silver, which will match beautifully with your new Aluminium case. The other colour is champagne, and is the sort of anodised gold look that instantly polarises opinion.

If you're after for aesthetics in a PSU, then the iCute4 is the answer to your prayers. For people who never open their case they are overkill, but if case modders were to dream about power supplies, then they would probably dream of these. And naked people.

SPECIFICATIONS

6 Molex connectors, 2 x 80mm fans, P4 compatible 4200: 420W 3200: 320W

Web site: Anyware www.anyware.com.au
Supplier: Anyware www.anyware.com.au
Phone: (02) 9906 5227 **Price:** 4200: $199. 3200: $169

atomic 8.5/10

PCGA000003/A

It's a lot easier to take on an army

when you are one.

DUNGEON SIEGE

A ROLE-PLAYING GAME FROM CHRIS TAYLOR

Assemble and control a party of up to eight heroes at a time, as you battle your way through the seamless and expansive 3D world of Ehb. From warriors and archers to wizards, and even pack mules to carry your treasure, you and your party will take revenge on the evil lord's minions. Whether you're playing alone or in multiplayer mode, victory is within your grasp. Let the battles begin.

microsoft.com/games/dungeonsiege

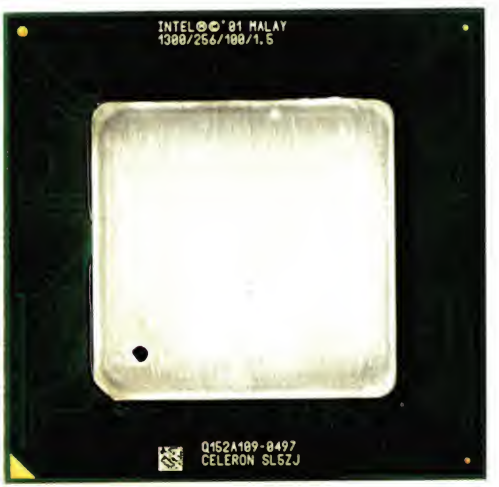
MA15+ MEDIUM LEVEL ANIMATED VIOLENCE

GAS powered GAMES™

Microsoft

Intel Celeron 1.3GHz

Bennett Ring checks out this Pentium III in disguise.

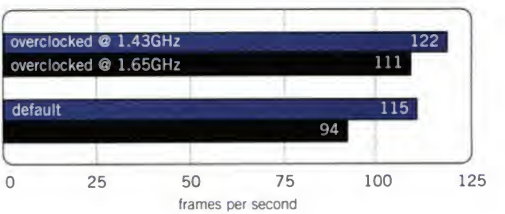


This Celeron is for all intents and purposes a revamped Pentium III manufactured using a 0.13micron process, also known as the Tualatin core. It even has the full 256KB cache that the Pentium III had. So, what's been revamped? Other than the inclusion of Data Prefetch Logic, a technique used for predicting what data is needed next and then pre-loading it into the cache of the CPU, not a great deal. A heat spreader, like those on found on the Pentium 4, has also been introduced, making this Celeron a right tough bastard, able to cope with the rigours of repeated heatsink installations if need be. Unfortunately the new Celeron still has the Achilles heel that has plagued the Celeron since the inception of AMD's Duron: a 100MHz front side bus. When combined with the fact that you can't run the system memory asynchronously to the FSB, limiting it also to 100MHz, we can see that regardless of how fast the CPU can chew through the numbers it's going to be crippled by how fast it can talk to the rest of the components within your PC.

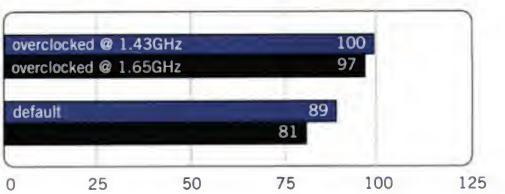
This CPU architecture obviously has a bit of headroom that is not yet being utilised by the 1.3GHz version. We managed to overclock our Celeron to an impressive 1.65GHz via a 27MHz overclock of the FSB up to 127MHz, with a 0.1V increase in the Vcore to 1.6V. That's a 27% increase in speed, which is quite noteworthy for an already speedy CPU.

The benchmarks are where we sort out the haves from the have-nots, so we installed the Celeron into an ASUS TUSL2-C (supplied courtesy of CASSA, www.cassa.com.au), alongside our normal reference gear before firing up three different CPU benchmarks. We chose an SD-RAM motherboard, as SD-RAM is what the Celeron is most likely going to be used with in the real world. It must be noted that to run this Celeron you'll need a fairly new motherboard that supports Tualatin CPUs – not a good thing for those looking for a cheap upgrade to their old Intel system. The first test was Quake 3: Arena using our CPU settings, and at its default speed the Celeron scored a

Quake 3: Arena



Serious Sam SE Coop demo



Duron 1.3GHz

Celeron 1.3GHz

respectable 94 frames per second; once overclocked this rose by 18% to 111fps. While these are impressive scores for such a cheap chip, neither is fast enough to beat the Duron at its default speed of 1.3GHz. Next up was Serious Sam. We lowered the graphics to the speed setting, lowered colour depth to 16-bits and ran at a resolution of 320 x 200 to ensure it was the CPU doing the hard work, not the graphics card. The Celeron managed to score 81 frames per second, with a 20% increase to 97 frames per second when overclocked. Again, this is fast, but not Duron fast. The final benchmark was SiSoft Sandra Professional 2002, which shows the theoretical performance of the CPU. The Celeron did very well, especially when overclocked, but the real world benchmarks show that the slow FSB negates the benefits of the fast CPU internals.

Considering you'll probably need a new motherboard to run this Celeron, it isn't exactly a cheap upgrade proposition. The shift to a Pentium 4-based Celeron later this year will make the upgrade path very limited in the future. However, if you do happen to have a motherboard that can run this Celeron, it could make for a nice interim upgrade until you go the Pentium 4 route. Otherwise the Duron is a cheaper, faster offering, with much better potential for upgrading in future.

SPECIFICATIONS

256KB Cache, Tualatin Core, 0.13Micron process, 1.45V core voltage, Socket 370

Web site: Intel www.intel.com

Supplier: AusPC Market www.auspcmarket.com.au

Phone: AusPC Market (02) 9817 2899 **Price:** $260

AMD 1.3GHz Duron

You don't need mega bucks to get MHz, reveals Bennett Ring.

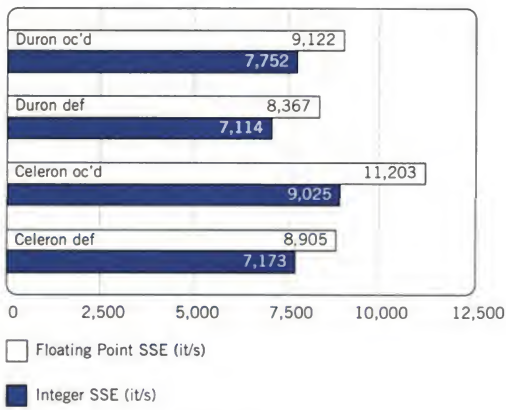
Ever since going head to head with Intel's Celeron, the Duron has helped to establish AMD's reputation as an Intel killer. This was due to a combination of two things: the zippy internal architecture of the Duron, and the speedy EV6 bus that it uses to receive and send the data it has to work with. With the release of the Tualatin based Celeron, which is in effect a die shrunken Pentium III, the internal speeds of these two products are now neck and neck a – just take a look at our SiSoft Sandra 2002 Professional benchmarks for proof.

This Duron uses the same Morgan core as the 1GHz Duron we reviewed in Issue 9, so we won't cover old ground discussing the technical doo dahs that this CPU features. For those who have forgotten, the Morgan is simply a Palomino minus half the cache. It looks as if the Morgan architecture is starting to peak, as our overclocking efforts only yielded a meagre 10% increase, up to 1.43GHz. Even though we closed the L1 bridge, the multiplier was locked at a constant 13X, meaning we had to resort to front side bus overclocking. Does this mean AMD has begun multiplier locking all of its CPUs? Please God, say it ain't so!

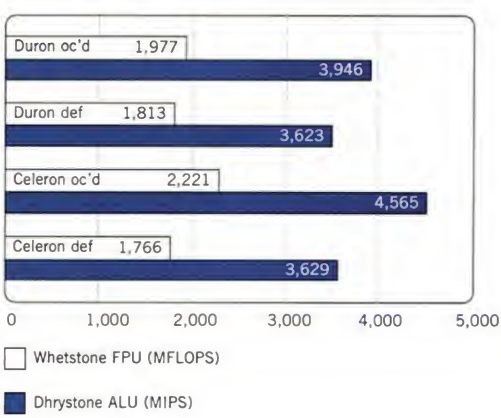
When it came time to do a few laps of Benchmark Park, we installed the Duron into our standard AMD testbench, because if you're using an AMD system nowadays, you're probably going to be using DDR-RAM. As the Sandra benchmarks attest, the internal number crunching abilities of the Celeron and Duron are basically identical. However, the real world benchmarks of Quake 3: Arena and Serious Sam highlight the difference the EV6 bus, which runs double pumped at 133MHz (giving it a theoretical bandwidth of 266MHz), makes over the Celeron's laughable 100MHz FSB. Even when the Celeron was overclocked to 1.65GHz, it couldn't keep up with the Duron's Q3A score of 115 frames per second. Serious Sam proved to be a much closer match, with the Duron hitting 89fps at default speed and 100fps when overclocked.

As the benchmarks indicate, the Duron is still the victor at the 1.3GHz post. Intel has tried hard to close the gap by releasing the 1.3GHz PIII, I mean Celeron, but its crippling bus speeds and lack of support for fast memory mean the Duron still has what it takes to leave the Celeron eating dust. Add to this the fact that you probably won't need a new motherboard to run the Duron, as well as its improved future prospects for upgrading, and it doesn't take a quantum physicist to recommend AMD's value processor over Intel's. O

Sandra CPU Multimedia



Sandra CPU Arithmetic



SPECIFICATIONS

128KB Cache, Morgan Core, 0.18micron process, includes SSE instruction set

Web site: AMD www.amd.com

Supplier: AMD www.amd.com

Phone: NA **Price:** $230

Thermaltake Volcano 7

The first thing you'll notice about the Volcano 7 is its huge size. At 80mm x 80mm x 80mm, it's easily one of the largest HSFs available. This is due to the 80mm fan, as well as the shroud used to mount this behemoth. The benefit of using such a large fan is a lower noise output while still managing to pump through a decent amount of air. A nice touch is the use of two cables, one for power and one for fan monitoring, allowing you to power it directly from your PSU while still being able to monitor the fan speed via your motherboard.

The most innovative feature would have to be the built in temperature probe, which controls the speed of the fan from 2900RPM at 25°C up to 5000RPM at 35°C. Sounds like a great idea, increasing the throughput when it's needed, right? Wrong. It appears that the lead designer's pet gibbon had the final say about where this probe was to be placed. Instead of being nestled in the bottom of the heatsink as you'd expect, the probe sits at the exterior of the fan measuring case temperature, which means that unless you've got a very hot PC case, you're never going to see this thing hit top speed. It could have been a great idea if only it had been mounted in the heatsink, so that the fan speed increased as the CPU temperature did. As it is, this innovation only serves to cripple the unit.

This is reflected in the temperatures we recorded with this device. The idle temperature reached 49°C, the same as our FOP-38, which is very respectable for such a quiet HSF. However, under load its temperature of 56°C was a full 6°C hotter than the 50°C that the FOP-38 reached.

The Volcano 7 is not without its merits: it looks scrumptious, is fairly quiet, and performs well when not being pushed too hard. As such it would make a decent unit for those who don't demand the ultimate in cooling. If only the temperature-controlled fan had been better implemented, it could have been a winner of a HSF.

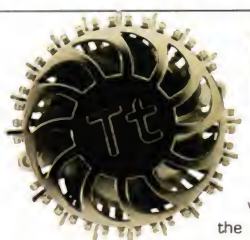
SPECIFICATIONS

Copper insert in base, Aluminium construction, 2900-5000RPM fan.

Web site: Thermaltake www.thermaltake.com
Supplier: Aus PC Market www.auspcmarket.com.au
Phone: Aus PC Market (02) 9817 2899 **Price:** $57

atomic 7/10

Thermaltake Crystal Orb



When you're overclocking your video card's core speed, one of the main limitations is overheating. An overclocked core can get hotter than a jockey's crotch on a balmy Melbourne Cup Day, leading to instability and graphical corruption. Until now, the custom cooling options you can install on your video card have been very limited, with Thermaltake's Blue Orb being perhaps the most popular solution available. To solve the heat dissipation issues that are keeping you awake at night, Thermaltake has released a new video card chipset cooler, the Crystal Orb.

The base of this unit is made of copper, but it isn't obvious because the entire heatsink has been nickel plated, giving it an attractive, gleaming finish. This makes the Crystal Orb the first custom video HSF to use copper. The hard nickel-plating, apart from looking swish, also helps to stop the softer copper from getting dented or misshaped, which is a common problem with copper coolers.

Included within the kit are a sachet of thermal paste, two push pins for mounting and a power adaptor. You won't be able to use your video card's onboard heatsink power source, as the fan is connected by a standard 3-pin power plug, hence the need for the Molex-to-3-pin power convertor. Using the included push pins to mount the unit is simple, although you might want to check that the mounts on the Crystal Orb match up with the HSF mounting holes on your video card.

To test this HSF we overclocked the core of a Hercules GeForce2 GTS with its standard HSF in place, before trying to push it even further with the Crystal Orb attached. When using the standard HSF, we raised the core speed from the default of 200MHz up to 225MHz before encountering stability issues. After attaching the Crystal Orb – with a dash of thermal paste to help out – we managed to increase the core speed to 245MHz, an increase of 9% over the standard HSF. It was a little noisier than the standard HSF, although that's the price you pay for performance air-cooling.

There aren't a lot of video card HSFs available, but you can rest assured that the Crystal Orb is the leader of this limited range. And at only 30 big ones, you've got no excuse.

SPECIFICATIONS

50mm x 50mm x 15mm; 5500RPM fan; 12.4CFM, ball bearing fan.

Web site: Thermaltake www.thermaltake.com
Supplier: Aus PC Market www.auspcmarket.com.au
Phone: Aus PC Market (02) 9817 2899 **Price:** $33

atomic 8/10

WAITEC CLIPP

When Atomic first saw an 80mm blank CD-R, we knew it wouldn't be long before a portable MP3 player using this media would be on the market. And what do you know, the CLIPP is just that – and it has an even more impressive feature: this 90mm x 125mm, 230g device also happens to be a portable CD-R burner, attachable via USB.

Due to the USB connection, the CLIPP is limited to a maximum burn speed of 4x. Considering that an 80mm CD-R can only record a maximum of 23 minutes of audio or 200MB of data, this speed constraint shouldn't be too much of a problem as you won't be burning huge amounts at one time. 200MB can store around four or five full albums of MP3s, which is more than enough to keep you grooving for even the longest of train trips.

No drivers are necessary to install the CLIPP (except with Win98) – simply plug it into your USB port and Windows automatically detects the drive. This makes it a great mobile device for backing up smaller amounts of data, as you won't need to take a driver or installation CD with you if you want to hook it up to a new machine.

We tested the MP3 and audio playback capabilities with a range of MP3s, from 128Kbps up to 320Kbps. The CLIPP had admirable audio quality for each type, being crisp and clear even at the highest volume setting.

Unfortunately, the CLIPP wasn't without problems. Occasionally it would hang when playing or burning CDs and, based on the fact that it chewed up approximately half of the battery power after burning for around seven minutes, the battery life when burning CDs looks to be very limited. Speaking of the included rechargeable battery, the clipping mechanism used to keep this in place is quite poor, prone to dislodging after a jolt.

Regardless of these quirks, the CLIPP could be a very convenient device for those who don't own a CD burner or a portable MP3 player, but want both. The asking price of $799 seems pretty hefty until you consider the combined cost of a standalone CD burner and MP3 player.

SPECIFICATIONS

14 minute antishock buffer, 80mm CD-R format, included rechargeable battery
Web site: WAITEC www.waitec.com
Supplier: ABC Creative Sol. www.abccreativesolutions.com.au
Phone: ABC Creative Sol. (07) 3358 1500 **Price:** $799

atomic 7/10

WAITEC HipHop

The 'WAITEC HipHop portable MP3/CD Disk Player' touts itself as capable of both MP3 and CD-DA (music CD) playback on 80mm CDs. Of course, with only 185MB of storage to play with, coupled with a severe tendency to skip while playing CD-DA on the move, the HipHop is really only useful for MP3 playback.

As the unit's lightweight plastic construction suggests, it's designed for music on the go. To and from work, out and about on a weekend, whatever – it's a player for those who don't have time to sit down and listen to their music on a $12,000 sound system. If by chance you do happen to have access to a $12,000 sound system, you can use the HipHop's Lineout to annoy your neighbours.

Despite the plastic design, HipHop is relatively sturdy. You wouldn't want to test it using FrisbeeMark, but other than that the unit will take a reasonable amount of punishment. Sound quality with the supplied headphones is only slightly above average, which was disappointing. However, plug in a decent set of headphones and the quality improves out of sight. Mozart, Aphex Twin, Cold – the HipHop performed admirably regardless of genre. Our tests covered CD-DA, as well as a range of MP3s in different genres from 128Kbps up to 320Kbps at 44.1kHz.

The HipHop has ID3 tag support for MP3s, with the line remote's LCD displaying file names followed by any ID3 information present. There are 5 preset equalizer settings, but unfortunately no capability to program your own.

You can program a playlist of up to 32 songs and listen to them relatively skip-free with 480 seconds of Electronic Skip Protection on a standard 128Kbps MP3 but, despite claims of 160 seconds ESP for CD-DA, the unit barely reaches a minute of playback at walking pace before skipping occurs.

Two AAA batteries (Ni-MH rechargeables included) provide anywhere between 3 and 6 hours of playback, depending on what formats are played. A mains adapter is also provided.

Overall, the HipHop is a good player slightly let down by poor CD-DA ESP and average headphones. If all you want is a portable MP3 player and you don't mind buying a decent set of headphones, HipHop could be for you. Add price to the mix

SPECIFICATIONS

CD-DA (160 sec ESP) and MP3 (480sec ESP, 32Kbps - 320Kbps at 32, 44.1, 48kHz, ID3 support) CD-R, CD-RW.
Web site: WAITEC www.waitec.com
Supplier: ABC Creative Sol. www.abccreativesolutions.com.au
Phone: ABC Creative Sol. (07) 3358 1500 **Price:** $325

atomic 8/10

Gigabyte AR64S-H

Is this the end of the blue PCB? John Gillooly is red with anger.

There must be some big smiles eminating from ATI headquarters at the moment. Last year the graphics chip maker decided to shift its business model from making its own boards to supplying chipsets to third party manufacturers, such as Gigabyte. This has allowed it to gain much more leverage in the market, and judging from the early sales figures there are happy campers all round.

Gigabyte's first ATI offering is based upon the RADEON 7500 core. This is a die shrunk, slightly altered version of the original RADEON card, and is aimed as ATI's budget gaming solution. Unlike the RADEON 8500's programmable transform and lighting support, the 7500 uses a fixed hardware T&L engine, which is of course fine for 99.99% of the games on the market today.

The AR64S-H uses the 7500LE variant of the chipset, running at a core speed of 230MHz, with 64MB of SDRAM running at 170MHz. It may not equate to a performance solution in the eyes of many, but the RADEON architecture does not suffer enormously from this pairing. This is strapped onto a red PCB, which marks a move away from the blue PCB that has been Gigabyte's trademark for a long time now.

These days video cards are all about value adding to differentiate them from the crowd. Gigabyte has done this in several ways: the card comes with V-Tuner software, which is a slick GUI for overclocking and temperature monitoring. It even allows you to crank up the fan speed on the card if you are finding the interior of your case getting a bit too toasty.

The interface is intuitive and easy to use, and even though it may replicate the functions of third party applications, it indicates that Gigabyte is committed to letting users fool around with the card's speed.

The other significant thing about the card is the heavyweight games package which includes Rune, Heavy Metal FAKK 2, Serious Sam, Motocross mania and cut-down versions of Oni and 4x4 Evolution – a decent bundle. Also included is the latest PowerDVD 4.0 XP.

We lined the AR64S-H up against the MSI GeForce4 MX440, the MX440 being the other contender in the budget field. The cards were tested with 3DMark2001SE Pro and Serious Sam SE on our Athlon XP testbench.

In 3DMark2001SE Pro there is a significant performance gap ranging from 27% at low resolution to 38% at 1,024 x 768. This disparity is still there, but nowhere near as severe in the Serious Sam SE benchmark, with the gap ranging between 14% and 18%.

Unlike the big brother RADEON 8500-based family of cards, there are no features that make the RADEON 7500LE stand out from the GeForce4 MX440. Add this to the performance gulf and there is a distinct feeling that the RADEON 7500LE is a case of too little, too late. It is unfortunate, because the card performs well, looks good and comes with a host of added extras, but in the end it is dwarfed by the next generation. Hopefully the soon to be released RV250 core from ATI will rectify this gap.

SPECIFICATIONS

ATI RADEON 7500LE core; 64MB SDRAM; V-Tuner software; TV-Out; dual display support.

Web site: Gigabyte www.gigabyte.com.tw

Supplier: Synnex www.synnex.com.au

Phone: Synnex 1300 880 038 **Price:** $199

atomic 7/10

WHAT HI-FI?
BEST BUY MAY ISSUE 2001
★★★★★

CINEMA DSP DIGITAL

dts VIRTUAL 5.1

VIRTUAL DOLBY DIGITAL

Your computer never sounded so good.

Finally, your home computer doesn't have to sound like one, thanks to Yamaha's unique Multimedia Home Entertainment system. The Yamaha AP-U70 Multimedia Amplifier simply plugs into your computer via USB cable, and accommodates your audio equipment and speakers via standard hi fi connections.

Instantly you can enjoy all of your favourite movies, music and games the way the sound was intended to be played and heard.

The AP-U70's versatility is amazing: set up your own private home theatre utilising the same digital technology as Yamaha's best home theatre amplifiers, with Cinema DSP Digital processing, Virtual Dolby Digital and DTS sound.

Play games with more dynamic sound, listen to high-quality Internet music and even record and edit your musical selections with a very cool graphic user interface.

The AP-U70 also has great connectivity for external sources such as DVD, CD, CDR, cassette, MP3 or MD player, and is available with Yamaha's compatibly designed NS-U30 speakers.

Thanks to Yamaha, now is the best time to upgrade your computer sound. For further information or stockist details simply call: **1800 682 705**

The AP-U70 is now available at the following participating stores:
ACT • Harvey Norman - Fyshwick • Miranda Hi Fi, Canberra
NSW • Cabramatta Hi Fi - Cabramatta • Domayne Computer Store - Penrith • Haberechts Retravision - Albury • Harvey Norman - Auburn, Balgowlah, Liverpool, Moore Park • Len Wallis Audio - Lane Cove • The Good Guys - Rockdale • Worldwide Appliances - Tamworth **VIC** • Brashs - Preston • Denman Audio - Melbourne • Encel Lifestyle - Doncaster • Encel Stereo - Richmond, Niddrie • Harvey Norman - Cheltenham, Corio, Maribyrnong, Moorabbin, Sydenham • Inner City Sounds - East Keilor **QLD** • Harvey Norman - Browns Plains, Bundaberg, Everton Park, Indooroopilly, Kawana Waters, Mackay, Mt Gravatt, Oxley, Rockhampton • Hoopers Sound Centre - Gympie • Todds Hi Fi - Tingalpa, Virginia • Toombul Music -Toombul **SA** • Challenge Hi Fi - Prospect **WA** • Kalgoorlie Audio World - Kalgoorlie

*PC Computer System depicted is for visual purpose only. AP-U70 is compatible with PC/Windows® & Macintosh®, check system requirements.

YAMAHA

www.yamaha.co.jp

Sound Blaster Extigy

Simon Peppercorn doesn't want to hear Led Zeppelin in a stone corridor ever again. . .

The Sound Blaster Extigy is the first complete external sound card from Creative. The Extigy is an entire USB sound solution, which can be used with a PC, a laptop, or even as a standalone digital decoder for your DVD player.

It should not to be compared with devices such as the Hercules Games Theatre or indeed the Sound Blaster Audigy Platinum eX that combine a panel with a PCI card.

The first interesting thing you'll notice about this unit is that you don't need to remove your existing sound card if you don't want to. The Extigy is smart enough to detect the presence of another sound card and automatically becomes your primary sound device if it's connected. If you unplug the Extigy your system will automatically revert back to your internal sound card. Installation, by the way, was a breeze under Windows 2000, and there is of course full support for Windows 98SE or higher including XP. Sadly there is no support for Linux users just yet.

USB still has some bandwidth hurdles to clear when it comes to pumping large amounts of data across the bus, particularly when you may be running multiple USB devices simultaneously. Despite the fact that Creative has been moving forward with products that use FireWire, the Extigy is only a USB 1.1 device. Even though this has a 12Mb/sec bandwidth and a theoretical total of 256 devices off one USB interface, real-world usage of multiple USB devices can see as little as 1MB/sec available.

Expect the Extigy to give your CPU a bit of a work out as it takes over some of the audio processing tasks – and dual processors won't help, as the Extigy doesn't support SMP.

In fact, Creative recommends that the Extigy should not be used concurrently with other bandwidth intensive USB devices. Not an ideal situation if you're into Webcams or scanners, and you can forget USB CD burners.

Installing this in a system with an A7V266-E, Athlon 1.2, and 512MB DDR, CPU usage from the Extigy was averaging around 15%. This is OK for playing back MP3s, but could have a real impact on game performance, depending what other processes you have consuming precious CPU cycles. So while Medal of Honor may sound real pretty through the Extigy, you will need a fairly powerful system to not notice the subsequent drop in frame rates that could be encountered. However, even with a USB mouse, and a USB Webcam capturing my maniacal grin, there didn't appear to be any real problems with either playability or stability. After all, how many USB devices could your system need to use while gaming? I count a mouse, perhaps a keyboard, and possibly a modem or Ethernet adapter, none of which need every bit of bandwidth USB can supply.

The Extigy does sound sweet too: the signal to noise ratio of >100dB means practically no audible background noises or hiss. This is a direct result of the 24-bit/96KHz multi channel DACs (Digital-to-Analog Converters). And a total harmonic distortion of 0.006% is nothing to sniff at.

Creative has also given us CMSS (Creative Multi Speaker Surround) technology, which basically mixes a standard two channel output into a 5.1 digital signal, and works well provided you are using a 5.1 speaker setup.

The Audio Clean-Up function is designed to minimize pops and clicking noises from recordings taken from older sound sources, such as vinyl records and cassettes. Also featured is 'Time Scaling' which allows audio playback to be sped up or slowed down without affecting sound quality or pitch.

Extigy is bundled with the type of applications you are used to seeing with other Creative devices, with a few alterations. There is no support for soundfonts, with only one General Midi patch set. EAX effects have now been moved from the Creative Mixer to the Creative Sound Centre, although personally I find most of the effects to be something of a novelty. Who cares what Led Zeppelin sounds like in a stone corridor, or a sewer pipe?

Also bundled are editing/mixing/recording tools and full bit rate MP3/WMA ripping software with the ability to burn your own discs.

The Sound Blaster Extigy is a very capable, well featured, solution, and would keep most sound aficionados happy. But it would be better off if it used a FireWire interface to overcome the limitations of USB. And would it kill Creative to start including support for Linux out of the box?

SPECIFICATIONS

SNR >100dB, 24-bit ADC, 24-bit DAC, Support for SPDIF input and output, MIDI I/O Connection, Remote Control

Web site: Creative www.creative.com

Supplier: Creative www.creative.com

Phone: Creative (02) 9666 6100 **Price:** $399

atomic 8/10

3D Prophet AIW 8500DV

Bennett Ring foresees that this Prophet is going to kick butt.

Hercules recently decided to produce ATI-based video cards rather than those using NVIDIA chipsets, a decidedly risky move to say the least. Considering the slower performance of the Radeon 8500 compared to the GeForce3 and 4, it's a surprising decision. If all you want is sheer power, don't bother reading on.

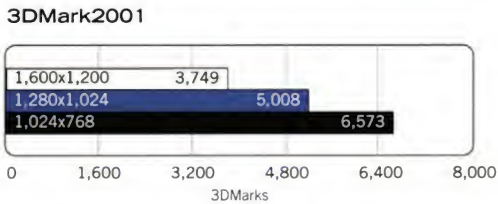
This version of the Radeon 8500 is clocked lower than the standard 8500, with a 190MHz memory speed and a 230MHz core speed. This is reflected in the benchmarks, with scores slightly slower than those of a full blooded 8500, but it certainly doesn't make this card a slouch when it comes to high velocity visuals either. The All-In-Wonder 8500DV makes up for this lower performance by cramming in more extras than you would have thought possible for a video card.

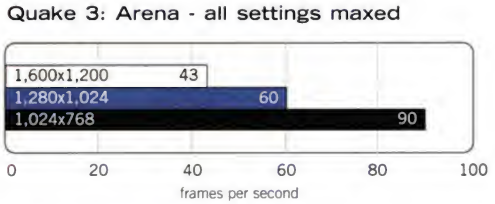
If you want a video card with multimedia features, look no further – this card has it all. The included stereo TV tuner should satiate your couch potato needs, and because it's based on a silicon chip, this part of the card is much smaller than regular TV tuners.

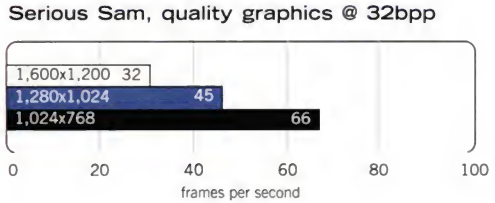
During tests of this feature we found the television image quality to be much better than most we've seen in the past as well as tuning more quickly than other TV tuners. A nice touch is the ability to make the TV image transparent, so you can keep working on documents behind the image. Digital VCR software is also included, allowing you to record TV shows at maximum quality of MPEG-2. You can also use a TV-on-demand feature, which records shows as you watch them, allowing you to pause the show or search through it at will. Unfortunately this caused the TV image to jump and skip, and was so demanding on system resources that it utilised 100% of the CPU processing power of an Athlon XP 2000+ system.

The 8500DV is loaded to the hilt with different types of I/O ports: on the card itself are a coax cable input, a DVI-I output, a FireWire port and a proprietary connector for the additional I/O break out box. On one side of the small breakout box are more inputs: an additional FireWire port, S-Video in and an RCA audio and video in. On the other side of the breakout box are even more outputs: S-Video, SPDIF and A/V RCA.

If you like massive, chunky remote controls, you'll be impressed with the included remote – it is quite simply huge. Instead of the usual IR method of communicating with the card, this remote uses RF, giving it a maximum range of 50 feet and allowing remote control through objects.







As we've come to expect with ATI drivers, the level of control over the features is amazing, being both intuitive and clear. And when it comes to DVD playback, any of the RADEONs are hard to beat, thanks to the Video Immersion II technology, which is an advanced form of video de-interlacing. We're not sure if the TV tuner uses this technology, but going by the quality of the image presented we're guessing that it is.

Finally, the Hydravision software and multiple outputs of the card make configuring a multi-monitor setup a breeze.

As stated earlier, this isn't the fastest card around, so the performance freaks who demand the ultimate in frame rates should stick with an NVIDIA chipset. However, for those who like to use their video cards for more than simply playing games, the abundance of features on the 8500DV make it well worth the high asking price. Now if only there was a GeForce4 All-In-Wonder. . .

SPECIFICATIONS

Every AV I/O port you can think of; 64MB DDR-RAM; R200 core

Web site: Hercules http://au.hercules.com
Supplier: Guillemot www.guillemot.com.au
Phone: Guillemot (02) 8303 1818 **Price:** $999

atomic 9/10

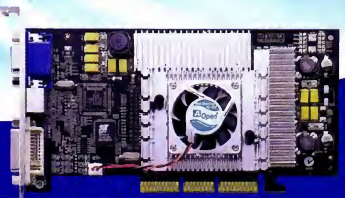
MOTHERBOARDS | ADD-ON CARDS | CASES | CD/CD-RW/DVD DRIVES

EXTREME MACHINE

WITH AOpen GEFORCE 3 TITANIUM

The amazing Titanium Geforce 3 from AOpen will enable you to maximize entertainment with infinite Graphic effects. Powered by the super engine from Nvidia Geforce 3 this range will offer Light Speed memory architecture with high performing 64MB DDR video memory. High quality TV output for big screen gaming or stable presentations . With the Silver cooling fan & heatsink and bundled with the latest professional Win DVD software, the Titanium range is the best solution for your entertainment identity!!!!
For the complete details, visit :

www.servex.com.au



TITANIUM SERIES 500/200

Servex Australia Pty Ltd.
TEL: (02) 8745-8400
FAX: (02) 8745-8499
e-mail: marketing@servex.com.au
http://www.servex.com.au

AOpen®
Solutions · Components

MOTHERBOARDS | ADD-ON CARDS | CASES | CD/CD-RW/DVD DRIVES

P4 Black Pearl + DDR333

AX45 Power up SiS645

SiS645+961 chipset

Intel Socket 478 CPU(Willamatte/Northwood) Support
DDR333/PC2700 Support, highest Memory Speed
MuTIOL Connection - delivery 533MB/s bandwidth
ATA100, AC97 Audio, 6 Master PCI Slot
4X AGP Slot, 6 USB Port (4 by optional cable)

www.servex.com.au

AX45-V Motherboard

1. Intel i845D+ICH2
2. Socket478 CPU Support
3. DDR266 Memory
4. 4X AGP Slot, AC97 Audio

AX4B

1. Intel i845+ICH2
2. Socket 478 CPU Support
3. PC100/PC133 Memory
4. 4X AGP Slot
   AC97 Audio

AX4BS-V

1. SiS650+961
2. Socket 478 CPU Support
3. DDR 266 Memory
4. Integrated VGA
   AC97 Audio

MX46

servex
Servex Australia Pty Ltd.
TEL: (02) 8745-8400
FAX: (02) 8745-8499
e-mail: marketing@servex.com.au
http://www.servex.com.au

AOpen®
Solutions · Components

COMPUTER! ct PC PC World SOUNDMAX

Dell Inspiron 8200

1,600 x 1,200 gaming on a notebook? John Gillooly must be crazy.

We are certain that there is some formula out there for working out the huge performance gulf between notebook and desktop 3D performance. Without any mathematics knowledge whatsoever, the formula looks something like Notebook = Desktop – 2 generations. Frankly, until the GeForce2 Go, there were no performance 3D options for those on the move. The GeForce2 Go changed this, but it still delivered lower performance than the desktop equivalent.

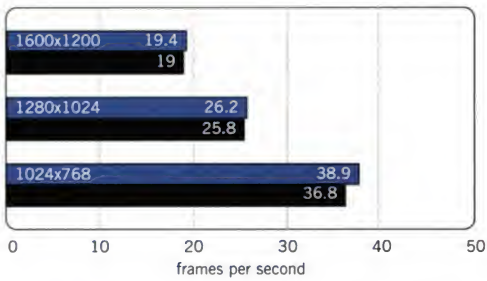
In order to rectify this, NVIDIA has been back to the drawing board and it has come up with an innovative solution. Using a new technology called MAP (Mobile AGP Package), it has crammed the new generation GeForce4 440 Go GPU and 64MB of video RAM onto a package the size of a normal GPU. This allows for memory that delivers the high bandwidth needed for peak graphics performance.

Dell has taken this offering and strapped it onto the other major new advance in notebook technology, Intel's mobile Pentium 4 processor 1.7GHz-M, to make its new Inspiron 8200 notebook. Add to this 256MB of DDR RAM and a mobile version of the i845 chipset and this seriously ramps the processing power above the still respectable SDRAM based Tualatin mobile Pentium IIIs that were Intel's previous mobile speed kings.

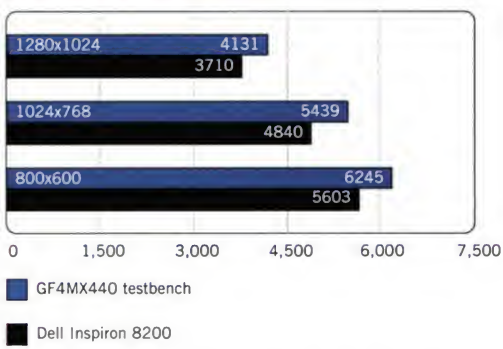
Besides the performance features, the Inspiron 8200 also features the usual overdose of accessories that characterise modern notebooks. One standout feature is that the RAM is user upgradeable using SODIMMs, a rarity in the Notebook field. The other standout is the inclusion of two pointing devices: the common touchpad and a Toshiba-style pointing stick, or G-Spot as it is known to the smuttier of us (it sits next to the G key).

By all rights the Inspiron 8200 should humiliate previous generation notebooks, so we did not even bother making the comparison. For benchmarking purposes we lined the Inspiron 8200 up against a testbench with an Athlon XP 1800+, 256MB DDR RAM and a GeForce4 MX 440. We tested using Serious Sam SE, 3DMark2001 Pro and SYSmark2001.

Serious Sam SE Cooperative demo



3DMark2001 Pro



In Serious Sam SE, the Inspiron stayed neck and neck with the testbench, even at 1,600 x 1,200, in which the Enhanced Ultra XGA TFT display showed none of the blurring that usually occurs in 3D gaming. At 1,024 x 768, the game is very playable at full detail, something unheard of in a notebook PC.

3DMark2001 showed the testbench pulling ahead by a small but noticeable amount, ranging between two and five per cent. In SYSmark2001, the performance is behind the current bleeding edge Northwood Pentium 4 and Athlon XP 2000+ level with an overall rating of 152, but it is the fastest notebook SYSmark2001 score we have seen.

The Inspiron 8200 is the mobile exemplar of maximum power computing. This is a notebook that is as much at home on your desk at work as it is powering the latest games at a LAN. The big surprise is the price. Whilst not cheap by desktop standards, it is also incredibly well priced for a notebook of its calibre. The future of notebook computing just got a whole lot brighter.

SPECIFICATIONS

Mobile 1.7GHz Pentium 4, GeForce4 Go MX440, 256MB DDR RAM, Intel 845MP chipset, 15in E-UXGA display
Web site: Dell www.dell.com.au
Supplier: Dell www.dell.com.au
Phone: Dell 1800 812 393 **Price:** $5,599

atomic 9.5/10

ABIT SILURO Ti500

If you feel the need for speed, Bennett Ring has just the thing.

You might be wondering why we didn't include this video card in our massive video card roundup last month. It's not that we think ABIT stinks or is a bit of a no-mate; it's just that this card arrived a couple of days too late to be included. So we'll ask the big question now: what makes this video card different to the multitude of GeForce3 Ti500 cards on the market begging for your spare cash? To be honest, not a lot.

If you whip out last month's Atomic and compare the benchmark results of the Ti500s with the SILURO, you'll see that they benchmark almost identically. While there is a difference of a frame or two between some of the tests, it's so small it can be put down to variance. This is the same phenomenon we've noticed with any of the video cards that use an NVIDIA reference design: they all perform extremely close to each other. Therefore we're left to look at the feature list and price point to determine which is the better video card.

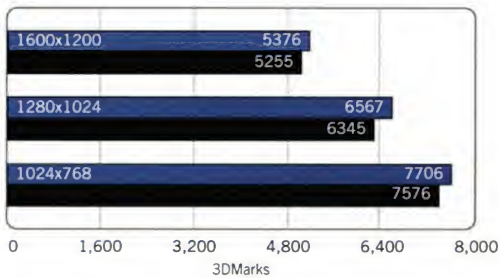
Based on these criteria, what does the SILURO have to offer that makes it better than the rest? Alongside the standard 15-pin D-sub you'll find a DVI out as well as a video out, which can handle both composite and S-Video. Other than a copy of WinDVD 3.X, that's it. Sorry, but there are no toy poodles, fake dog turds or four year old games to fill out this stocking.

If there is one thing that sets this card above and beyond the rest of the pack, it would have to be its impressive overclockability. The default memory speed for the Ti500 range is 500MHz, but we managed to increase this by 14% to 570MHz, with nary an onscreen glitch or crash to be seen. The core didn't do so well, staying at its default of 240MHz. As you know, increases of the memory speed lead to more tangible increases in performance than core speed increases, so we're not too fazed about the nonexistent core speed overclock.

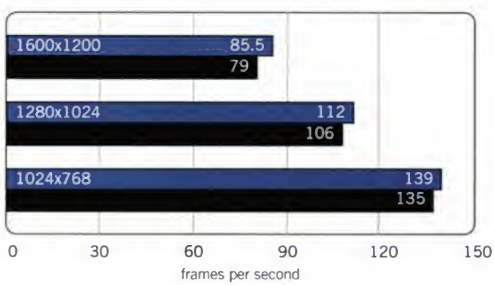
This 14% increase in memory speed lead to a maximum performance increase in our benchmarks of 8%, in the Quake 3: Arena test at 1600 x 1200. While this isn't quite the 14% performance increase we would have liked, we're not going to complain about a free boost of 8%.

With the global domination of the GeForce4 hyper chipset imminent, it's questionable as to how long the GeForce3 will remain a viable option. But then again, it's highly probable that the current GeForce3 prices will plummet with the introduction of the GeForce4, making the GeForce3 the Duron of the video card scene.

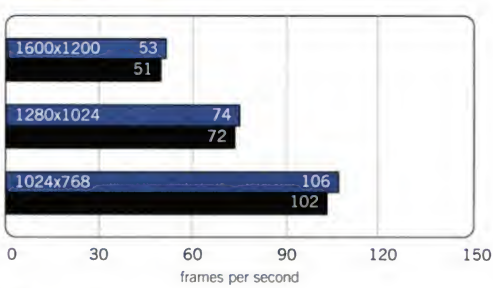
3DMark2001



Quake 3: Arena



Serious Sam



600/270

500/240

SPECIFICATIONS

4X AGP, 64MB DDR-RAM, DirectX 8 compliant, GeForce3 Ti500 chipset

Web site: ABIT www.abit.com.tw

Supplier: Checksun Australia www.checksun.com.au

Phone: Checksun Australia (02) 9317 3155 **Price:** $580

atomic 9/10

Pinnacle Studio 7 Deluxe

Pinnacle is unique in the fact that it is the only software company entirely dedicated to video editing for the retail market. While its products are used by several of the big players in video production – including NBC's coverage of the recent Winter Olympics – it remains that consumers are its bread and butter.

Pinnacle Studio version 7 may not have the depth of features that Adobe Premiere will have, but nor is it meant to. Part of the reason that it is also popular in professional circles is the ease with which it enables you to edit and produce top quality video, without added overheads in terms of expense, and the time taken to simply finish a project. This is achieved with a very streamlined and intuitive user interface and capture is simply a matter of plugging the video source into the capture card provided, and clicking play on the UI. The capture screen shows the footage being captured in the top right, placing key frames in a box on the left indicating scene changes for future indexing. Excellent capture features also include the ability to capture using a compressed format to save drive space while editing, and then transfer the edits to the source file.

Total newbies and pros alike will greatly appreciate the ease with which they are able to edit video with numerous effects and scene transitions available. Scenes are simply dragged and dropped into the timeline across the bottom, divided up into video and audio channels for the captured footage, titles, audio, and sound track, with a host of audio editing tools in the audio tool box.

Finally, the make movie stage is where the video is converted to its final format, analog video and MPEG, AVI, and streaming formats such as Windows Media or Real Player formats. The Deluxe pack comes with the Pinnacle AVDV capture card, featuring two DV capture ports (IEEE 1392), and a port for the blue breakout box, supporting S-Video, Composite, and audio in and out channels for each.

It also comes with Pinnacle Hollywood FX Plus for extra effects, and Pinnacle Express for creating VCDs. All told, Pinnacle Studio Deluxe kicks some major league 'Arse'.

SPECIFICATIONS

PCI card, external breakout box included, analogue to digital and vice versa supported.

Web site: Pinnacle www.pinnaclesys.com
Supplier: Pineapplehead www.pineapplehead.com.au
Phone: (03) 9852 7444 **Price:** $849

atomic 9/10

eDimensional E-D glasses

When it comes to peripheral devices that make you puke, there's not much around that can rival a pair of stereoscopic glasses. So it was with more than a little trepidation that we tested out one of the leading brands of stereoscopic glasses: the eDimensional E-D LCD shutter glasses.

First, a brief rundown on how stereoscopic glasses work. The glasses use an LCD shutter to alternately block the vision of the left and right eyes. At the same time, the onscreen image alternates between what your left and right eye would expect to see if the graphics being displayed were in the real world, using some tricky calculations with the Z-buffer to calculate the differences between the two. The change between the left and right eye view happens so quickly that your brain is fooled into thinking that the image on the monitor has three dimensions.

Now we've got the theory out of the way, it's time to see how these glasses shape up compared to the rest. Considering every other pair we've tried have given us the same symptoms felt on the morning after a hard night out, we weren't expecting too much from the E-D glasses. Which was a good thing, because it meant we weren't disappointed when these proved to suck just as much as the rest.

We tested the wireless version, which is claimed to be 'comfortable to wear for hours'. This is true if you spend most evenings inserting your head into a Greco Roman torture apparatus. As for the image quality, at 100Hz a distinct ghosting of objects on screen appeared to the left and right of the real object. Not to mention that because of the LCD shutters, you need to pump up the brightness to max on most games, resulting in very washed out colours. And yes, that good old stereoscopic headache we all know and love returned in full effect after an extended period of use.

Adding insult to injury is the asking price of these glasses: at $243 you could almost afford a new GeForce4 MX instead. If you enjoy wasting money or looking at degraded, albeit 3D, images you'll get a kick out of these glasses, while those who aren't insane should avoid at all costs.

SPECIFICATIONS

Wireless IR link, compatible with most video cards, 100Hz minimum monitor necessary

Web site: eDimensional www.edimensional.com

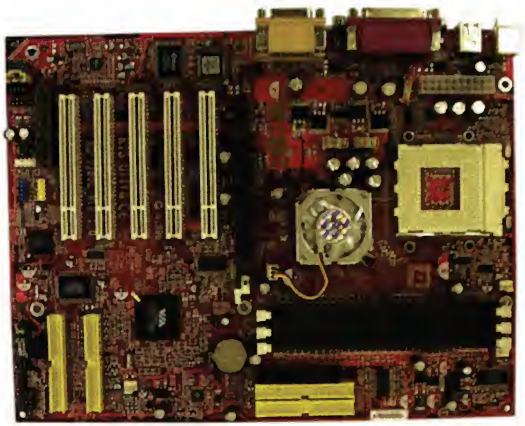
Supplier: Sheridz & Co Ltd.

Phone: Sheridz & Co Ltd. (03) 354 5448 **Price:** $243

atomic 4/10

KT3 Ultra-ARU

See first hand the wonder of a memory bottleneck, with John Gillooly as tour guide.



After a painfully slow start, DDR RAM found its feet late last year. With the release of the KT266A chipset, VIA provided a solution that finally delivered the speed that we expected from this high bandwidth memory. Peak performance was achieved using PC2100 (DDR266) DDR RAM, which runs at the same 133MHz bus speed as newer Athlon CPUs.

VIA's latest foray into DDR is with the KT333 chipset, which adds support for PC2700 (DDR333) DDR RAM. This made its debut with the 645 chipset from SiS for the Pentium 4 and Via's offering was the first appearance of DDR333 on an Athlon platform. Don't get too excited though, this chipset is actually being targeted more as an eventual replacement for the KT266A chipset than the deliverer of free speed.

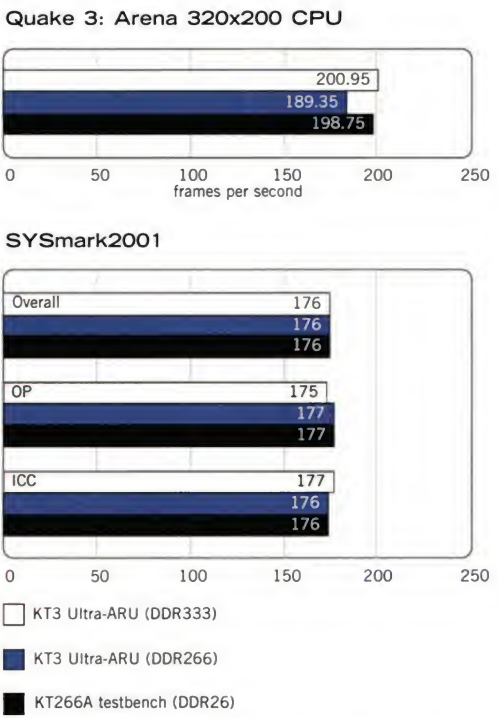
The reason behind this is, as always, bottlenecking. Even though DDR333 has an effective throughput of 333MHz, the Athlon is running on an effective 266MHz FSB. This means that the CPU ends up holding the RAM back. It remains to be seen if AMD bumps the FSB on the next generation Thoroughbred-cored Athlons to 166MHz (333MHz effective), solving the disparity.

Besides support for DDR333, the KT333 also utilises a new Southbridge from VIA, the VT8233A, incorporating support for ATA133 hard drives – which is something of a moot point considering the relatively poor manufacturer support for the standard at the moment.

MSI has used the KT333 chipset in its KT3 Ultra series of motherboards. The KT3 Ultra-ARU is the top end model, adding an NEC USB 2.0 controller, Realtek ALC650 6 channel sound chip and Promise ATA133 RAID controller to the mix.

We tested the KT3 Ultra-ARU using 256MB of Kingston DDR333, and compared it to the same board using DDR266 and our KT266A based Athlon testbench. We used SYSmark2001 and Quake 3: Arena. The results are remarkable in proving the point that the Athlon does not currently benefit from the increased memory bandwidth that DDR333 delivers.

In SYSmark the scores are so incredibly consistent that we reinstalled Windows and reran the tests just to be sure. The Quake 3: Arena picture is slightly different, but not by much,



with the KT3 running DDR333 beating out DDR266 on that configuration by just over five per cent and the KT266A by under one per cent, which can be ascribed to natural variability in the benchmark.

Whilst the KT333 performs at the fast end of the DDR chipset spectrum, it is nothing new: at the time of writing the Joint Electron Device Engineering Council (JEDEC), keeper of the DDR standard, has not yet finalised the DDR333 specification. This means that the first DDR333 modules may not even comply with final standards, and that the benefits of going straight to DDR333 may be outweighed by incompatibilities with later chipsets.

The KT3 Ultra-ARU is a decent enough motherboard, however with a host of great KT266A solutions on the market, and the pending finalisation of DDR333 standards, it could very well be the basis for one of those systems that early adopters get and are then left wondering why only a few months later.

SPECIFICATIONS

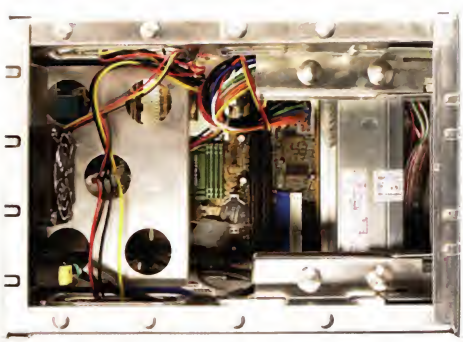
VIA KT333 chipset, USB 2.0 controller, Promise ATA133 RAID, Realtek 6 channel audio.

Web site: MSI www.msicomputer.com.au
Supplier: MSI www.msicomputer.com.au
Phone: MSI (02) 9748 0070 **Price:** $333

atomic 7.5/10

Shuttle SV-24

More TARDIS than PC? It'd better be, as John Gillooly gets inside.

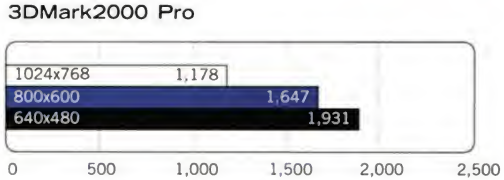


Over recent years motherboard manufacturers have continued to diversify their product lineups. Whilst a lot of attention is taken up by the developments on the video card front, manufacturers are also making inroads with what are known as bare-bones systems.

Rather than fully functional PCs, bare-bones systems are usually comprised solely of a case, power supply and motherboard. Cases vary between fairly standard Micro or Flex ATX sized ones and highly customised specialist designs. The philosophy behind these is that you can choose your own components and put them straight into the bare-bones unit.

Shuttle has produced the most striking bare-bones unit out there in the form of the SV-24. Taking huge inspiration from the popularity of Aluminium cases, the SV-24 is a sleek and tiny Aluminium unit. So tiny in fact, that at first look it seems impossible that you can fit a fully functioning system inside.

To get around this space issue Shuttle has employed a few little tricks. Firstly, forget about adding a video card. The SV-24 comes with integrated S3 ProSavage graphics built in to the VIA PL133 chipset, complete with TV-out via S-Video or Composite outputs. Also to be found onboard are AC'97 audio, IEEE 1394 via a Lucent controller and Realtek integrated 10/100 Ethernet.



Building a system inside the SV24 is part contortionism, part jigsaw puzzle, but if you follow the instructions in the right order then it proves to be no major hassle. The system uses Socket 370, and therefore supports Celeron, Pentium III and VIA C3 processors. In order to cram everything in, Shuttle supplies a low profile HSF to keep the CPU cool and this is more than sufficient for the supported CPUs.

There are two SDRAM slots, which for a sense of scale span the entire width of the case, plus there is a riser card so you can mount a single PCI card in the system. When all the motherboard slots are full it is a case of carefully nesting the hard drive, floppy and CD drive into their positions and plugging them all in.

This gives you a moderately powerful PC with a whole pile of inputs and outputs. Plus it is one of the best-looking PCs you will see. This is not a gaming rig in the traditional sense, but its portability and looks means that it is a great box for sitting in your living room and plugging into your home entertainment system. Add a DVD ROM drive and maybe a 5.1 channel soundcard and you have a decent DVD player as well.

While it's well behind the current generation 3D hardware, the ProSavage will be fine for desktop tasks and the occasional low-res TV gaming, just don't expect to be running Serious Sam SE at 1,600 x 1,200 high detail.

To demonstrate this we built a system inside the SV-24 using a 1GHz Pentium III with 256MB PC133 SDRAM and tested it with 3DMark2000 Pro and SYSmark2001. Because this system is not a performance solution we haven't compared the results, but this will give you an idea of how it performs. The 3DMark2000 Pro scores are quite low, driven by the relatively low-clocked Pentium III (compared to modern CPUs) and the lack of transform and lighting support on the ProSavage chipset. SYSmark2001 shows a similar situation, with fairly low scores by current standards.

With no pretence of being a high end PC, the major benefit of the SV-24 is that it provides a quiet, good looking base for your home entertainment needs, or a cheap, basic network server. And it does it in such a cute little package. This is the sort of system that you would be proud to have sitting in your living room.

SPECIFICATIONS

Bare bones system, FV-24 motherboard, VIA PL133, Aluminium chassis

Web site: www.spacewalker.com

Supplier: Sato www.satotech.com.au

Phone: Sato (03) 9899 6333 **Price:** $599

atomic 9/10

TDK velocd 321040

Based on the Sanyo BP1600P, this CD-RW from TDK is one of the latest burners to push the maximum writing speed up to a whopping 32X. This equates to a burn time of 3.5 minutes for a full CD-R of data, which will be a definite bonus for those who find themselves partaking in regular burning sessions.

The velocd includes buffer underrun protection as well as FlexSS-BP, a new technology that examines the condition of each zone on the CD before determining the highest possible burn speed for each of the zones. When combined, these two technologies ensure that you'll get the fastest, most reliable burn possible.

TDK doesn't scrimp when it comes to jamming the good stuff into its burner packs, and the latest velocd is no exception. Three blank CDs, a CD marking pen, Nero 5.5, TDK Digital MixMaster and InCD CD-RW packet writing software are all included, as well as detailed installation and software manuals. When you consider the asking price is a mere $399, the addition of all of this useful kit makes the velocd exceptional value for money.

Installing the velocd was incredibly simple, and the plethora of helpful instructions will enable even the most novice of computer users to get this drive working. There is even a large fold out poster that takes the user through the various steps needed to install the drive. If only all computer components were this easy to install, we wouldn't have to cover the walls of the Atomic labs with soft padding.

Time for the part of the review that you all know and love: the mighty benchmarks, using Nero CDSpeed 0.85. We used the included TDK 32X media to test the write speed, and recorded a maximum speed of 33X, with an average of 27X, using zone CLV. Super! Next up was read speed, which maxed out at 40X, with an average of 30X. Finally, we used our audio reference CD to test its ripping capabilities, and were more than happy with the average of 30X and maximum of 39X.

As per usual, TDK has churned out a superb product in its latest version of the velocd. If you need a burner, you can't go wrong with this high-speed beastie.

SPECIFICATIONS

4MB buffer, 32X write, 10X rewrite, 40X read, buffer underrun and FlexSS-BP protection
Web site: TDK www.tdk.com.au
Supplier: TDK www.tdk.com.au
Phone: TDK 1800 651 917 **Price:** $399

atomic 9.5/10

Sitecom USB-Dock

The Sitecom USB-Dock is a USB expansion module, which provides your PC or laptop with four extra downstream USB ports, a PS/2 mouse connector, a PS/2 keyboard connector, a RS-232 serial port and a printer port.

The unit is supplied with a generous six foot USB cable and an external 5V power supply adaptor. However, this power supply is only required if you need to use the USB ports that the module provides.

Apart from the benefit of simply having more ports available for all your worldly gadgets and toys, the USB-Dock takes care of all your messy IRQ problems, or jumper settings that motherboards like to torment you with, when it comes to expansion devices.

Drivers are provided on the installation CD for all versions of Windows from 98 and higher, except for XP. However, XP users should not despair as drivers are available from the Sitecom Web site. Installation was as simple as it should be, and after the obligatory 'Windows must now restart' routines, we were off and racing, plugging in devices faster than the device could demand "Fill me up Scottie".

This isn't a port replicator, and it doesn't work by sharing existing ports. It actually creates a bunch of new ports for Windows to play with. This means a second mouse port, a second printer port and so on. After setup, device manager displays a number of cool sounding 'Human Interface Devices' (HIDs), such as an HID compliant mouse as well as an HID compliant keyboard.

The size of the USB-Dock, which is not much larger than a standard mouse, makes it an ideal portable solution for laptops. With a minimum amount of case modding this device could even be permanently mounted into a PC, giving you more ports than you can shake a peripheral device at.

SPECIFICATIONS

4 USB ports, DB-9 serial RS-232 interface, DB-25 IEEE 1284 Bi-directional interface, 1 PS/2 mouse and kboard interface
Web site: Sitecom www.sitecom.com
Supplier: Innovision www.innovision.com.au
Phone: Innovision 1300 785 795 **Price:** $189

atomic 8.5/10

VoicePod ABA2020

As well as the IntelliMic, Altec Lansing has introduced the ABA2020 VoicePod. In simple terms, this device allows you to capture voice recordings and attach them directly into an email or document. I use simple terms here because that's as simple as it gets. Seriously.

Hit the record button and start talking. Hit stop when you're done. Play back to check what you have said, then send it to your document. Four controls, four buttons. This gets full points for ease of use alone.

Using standard audio codecs like GSM 6.1 and G723.1, the recordings are saved as .wav files. A 30 second message, recorded at 22.050KHz creates a file size of around 110KB, which makes all but the largest of files suitable for transmission over a dial up modem. The supplied software allows you to adjust compression and recording quality.

Using Altec Lansing's Clarix for noise suppression and distance control, the sound quality of the resulting .wav file is quite good. Remember that this isn't a tool designed for professional recording, but a tool for capturing voice notations and messages.

Unlike the sound recorder found in Windows, the only restriction to how much you can record is the amount of available hard drive space you have.

Installation is a snap, with a line-in, a line-out and a USB connection. A supplied splitter cable allows you to share the line-out of your sound card with the VoicePod as well as your existing speakers.

Unfortunately, the device lets itself down with its list of compatible applications. For the moment, you are stuck with Eudora Pro, Netscape Navigator, Outlook or Outlook Express, Word, WordPad, and Project. There will be support for a wider range of applications in the future.

The VoicePod certainly does everything it claims to do, with the added bonus of looking great on your desk. It isn't the cheapest gadget around, but it is one of the coolest.

SPECIFICATIONS

Clarix noise suppression, two 1.25in stereo speakers, 3in woofer speaker, USB interface
Web site: www.altecmm.com
Supplier: Innovision www.innovision.com.au
Phone: Innovision 1300 785 795 **Price:** $149

atomic 8/10

IntelliMic AIM4040

Altec Lansing is well know for its range of quality PC speakers, headphones and microphones. The AIM4040 IntelliMic is the latest product from this reputable manufacturer, but can it live up to the high expectations that are set by the brand name?

This high-end PC microphone relies on Altec Lansing's 'Clarix' noise cancellation technologies to give the best possible results in terms of voice capture. This makes it ideal for speech recognition, voice over IP, and other forms of computer telephony.

It happens to be quite a bizarre looking microphone, reminiscent of the old Radio City Music Hall microphones, as can be seen by the product shot to the right. As well as working with packages such as IBM ViaVoice Simply Speaking, Dragon NaturallySpeaking, Sound Forge and Cool Edit, the IntelliMic also performs with Web voice chat type services such as Yahoo! Messenger's Voice Chat, and the hallowed Roger Wilco.

With the increasing number of games that support voice communication, this sort of solution is great for those who have a good set of speakers and don't want to abandon them and turn to an inferior headset.

The IntelliMic is able to pick up sound within a user defined 'bubble' and cancel out ambient or extraneous sounds. This makes the microphone an ideal solution for noisy homes or office environments. There are actually two microphones in the AIM4040, as well as volume control, zoom function (for zooming the pickup bubble in and out) and finally a mute button. The microphone connects to the line-in of your sound card, but the software control and power is via USB. No external power source is required.

With a frequency response of 150Hz – 8KHz, and distortion of less than 1% at less than 100dB SPL, this microphone is certainly not a poor performer.

All good things, however, come at a price. Although this is probably the best quality PC microphone Atomic has tested, at $149 it's probably a lot more than a casual user could justify for a PC microphone. Unless you are absolutely hell bent on getting the best quality voices into your PC or laptop a cheaper solution may be appropriate.

SPECIFICATIONS

Max SPL: 120db SPL with 3% THD, Frequency Response: 150Hz – 8KHz, Impedance: 1k – 100k ohms drive capacity
Web site: www.altecmm.com
Supplier: Innovision www.innovision.com.au
Phone: Innovision 1300 785 795 **Price:** $149

atomic 8/10

Shady cults

Whatever Microsoft's overarching masterplan behind the Xbox is, John Gillooly sees the silver lining on the bumpmapped clouds of doom.

Sega may have long since departed from the hardware game, but the Dreamcast still looks frucking amazing. At least, it does compared to the vast majority of PC titles out there. The reason behind this is because the graphics hardware may not be that powerful by modern PC standards, but the developers sure know how to squeeze every last drop out of the technology they have to play with.

Unfortunately the PowerVR technology that powers the Dreamcast has never reached the relative heights of the first generation PowerVR cards from the days when anything 3D was new and amazing. If we were all running KYRO series cards rather than the NVIDIA ones that live in the majority of machines, then this experience in development for the Dreamcast would be flowing over to the PC. Plus the Dreamcast would probably still be around.

Contrast this to the Xbox. Even though the hordes of naysayers think it will kill the PC, some of the more intelligent, witty and sophisticated of us see the other side completely. In fact, we are already seeing the benefits with the release of the GeForce4 Ti video chipset, something that NVIDIA has been able to tweak based upon developer experiences with the Xbox GPU.

Hardware aside, the big bonus is going to be for game development. For way too long we have had to sit around and wait for games to catch up with our bleeding edge hardware. And then once the features are actually supported, our cards are a generation or two old and struggle to run the games at decent frame rates. The twofold combination of DirectX 8 compliant video hardware and a very PC development environment encourages developers to make use of the vertex and pixel shaders that live in the GeForce3, GeForce4 Ti and RADEON 8500.

One early result was used by NVIDIA to launch the GeForce4, and comes from a group of German programmers called Codecult (www.codecult.com). After the huge impact of the nature demo in 3DMark2001, pixel and vertex shaded natural landscapes are all the rage. ATI already has a nature demo for the RADEON 8500 and NVIDIA has used Codecult's engine to show off its hardware.

The engine in question is called Codecreatures, and thanks to Codecult we have had the joy of having a good look at the tech demo. It has to be seen on a DirectX 8 compliant video card to really get the true feeling of just how amazing it is, but it is one of the first pieces of game code that we have seen nail the ubiquitous large pool of water. Ever notice that any new 3D feature has to enhance the look of water? Environmental bumpmapping, hardware transform and lighting and programmable shaders were all notable in the 'realistic' depiction of H2O. It has been many years since I last stared transfixed at a blade of grass for hours on end. (OK, that was a blatant lie, it's been weeks.)

The great part is that this is running on an actual game engine that Codecult has developed from the ground up, rather than one spun off after a game is made. And the engine is multi-platform: Xbox, PlayStation 2, Gamecube, Windows, Mac and even Linux (that's right Brad, Linux). Of these Xbox, Windows, Mac and Linux all have programmable shader support (the Gamecube has a fixed T&L unit and the PS2 is a whole other beast altogether), which means that any engine designed to run on this range of platforms will almost definitely have DirectX 8 features available.

For a long while we have had to suffer from lacklustre support for our monster graphic cards. Sure, when playing the latest Half-Life mod we have to turn vsync back on because the tearing blurs the screen too much, and 4x antialiasing doesn't even touch the sides of the graphics pipeline, but we want those fancy features actually earning their fee.

About now Voodoo5 or TNT2 owners will be swearing quietly at the page, but fear not, the news is actually good for you. Thanks to the Xbox, when the graphics card upgrade comes, there will be games out there that actually take full advantage. Of course, this advice expires in a year or so when the next big thing in 3D happens. As we have seen in the past, things move fast in the 3D chipset industry, even if people think they have an eternal unassailable lead.

Which segues nicely into this: the 3dfx Web site is now no more. It went offline on 19 February. Considering a lot of our first experiences with 3D gaming came via a Voodoo of some sort, it marks the last gasp of the first generation in home 3D. I wonder who will be next? ○

Jedi Knight II: Jedi Outcast

atomic HOT

After applying a few subtle mind tricks, Bennett Ring was the padawan for this review

The airconditioning in this place is cranked a little too high.

The ultimate bad guys, Storm Troopers.

Jedi. It's easily the coolest word available in the modern geek's vocabulary. No other word inspires such feelings of awe, amazement and respect. It has been scientifically proven that every self-respecting *Star Wars* fan has at least once wished they could swap their own dull life as a human being for that of a Jedi. Unfortunately we can't yet buy midi-chlorian slushies down at the local deli to top up The Force, so the closest we can get to it is to play computer games. That, or become one of the nutters who dress up to attend *Star Wars* role playing nights, showing off the lightsabers they crafted from used toilet rolls and a yellow highlighter. We'll assume you're going to try the former method.

Continuing from the last game in the Dark Forces series you again play the part of Kyle Katarn. He doesn't behave like your average Jedi, more like a Han Solo type of guy than any woosy Skywalker. Our friend Kyle got a little too close to the Dark side of The Force in the last game and has since hung up his lightsaber for good, fearful of the temptation. Or so he thinks. It turns out the defeated Empire is still hanging around like a bad smell, so Kyle dusts off his lightsaber to hand some Storm Trooper butt back to the Empire on a platter.

As Kyle has forsaken the Force, you'll start the game without any jaw dropping abilities. You can try to use a Jedi mind trick on that Imperial Officer all you like, but he'll probably be more inclined to turn you into red vapour than believe you're actually a harmless mosquito buzzing by. Not to worry, because you'll be packed to the brim with hardcore, high-tech weaponry before you know it: a wide selection awaits your itchy trigger finger, including many items plucked directly from the existing *Star Wars* universe and a couple of new additions. The vast majority of these weapons are laser based, just like the movies, and each is rendered down to the very last screw. For some bizarre reason, to which only Yoda knows the explanation, the rounds from these laser guns don't travel at the speed of light, so you'll need to practice leading your aim in front of moving enemies. One of the earliest weapons is a favourite: the Storm Trooper assault rifle. On full auto this thing lays down a devastating hail of red bolts of hurt, cutting down rows of enemies in seconds. Each weapon is radically different from the others, and all but the stun baton have two modes of firing.

No matter how fond of these weapons you might grow, none can compare to the awesome stick of concentrated coolness that is a lightsaber. Oh, how I want a lightsaber. You'll be tested before you're allowed to use your lightsaber once again and rightly so. Once you've got it you'll be slicing and dicing bad guys like some kind of deranged food processor in a bad mood, leaving cleaved torsos and decapitated corpses in your wake. Not only does it look absolutely gorgeous as it cuts through the air around you, it sounds exactly how you'd expect, nay, demand it to.

The more you use your lightsaber the more proficient you'll become: tt can be used as a shield to deflect incoming shots, and eventually you'll be able to direct shots straight back to any enemy stupid enough to fire at a Jedi. There are a large range of different attacks and blocks available for the lightsaber, with more becoming available as you work on your Jedi skills. When using the lightsaber the view jumps to the third person, which amazingly helps the gameplay, making it simpler to choreograph your dance of death.

You'll need this formidable arsenal if you're going to have any chance against the hordes of Empire soldiers. Occasionally you'll fight alongside other Rebel soldiers and even Jedi, but for the most part you'll be going it alone. Everybody's favourite cannon fodder, the beloved Storm Troopers, are out in force, and in the game they are just as willing to catch live laser rounds in the chest as those in the movies. When a squad is being commanded by an officer it will display some pretty competent manoeuvres such as flanking or taking cover but take out the leader and you'll see team work and intelligence go out the window. This is because the AI uses a morale system, making troops function better when a leader directs them or the numbers are stacked in their favour. When you encounter a certain breed of enemy Jedi further into the game you'll quite simply be amazed at their intelligence. These guys are tough, intelligent, lightsaber-wielding little buggers, and aren't afraid to use the power of The Force upon you. But by then you'll be able to use it yourself.

The Force comes into play more than in any previous incarnation of the game, and is a joy to use. Powers range from mind tricks that make you invisible, to the infamous choke manoeuvre Darth Vader made popular with school kids in the 1980s. As you progress through the game your powers increase through three levels, finally making you a force that even the mighty Emperor would have

It's refreshing to see that aliens also give birth to identical twins.

I believe it's your round?

nightmares about.

The Empire is comprised of a motley bunch of criminals and low lives, and many of these make an appearance in the game. Each is immediately recognisable thanks to the beauty of the Quake 3 engine, which has been used in most triple A first person shooters of late. This engine excels at character detail, and it really shows in JKII. The human faces are the only weak point, but you'll rarely encounter these, and everything else is so faithfully recreated it's a moot point. It's not strange to have ten or more enemies on screen at once, all the while running smoothly thanks to four different LODs (levels of detail) for each character. An average texture resolution of 512 x 512, compared to the 128 x 128 textures in the original Quake 3: Arena, help to make the graphics truly special.

This engine is also responsible for the impressive environments. One of the only criticisms levelled at the Quake 3 engine is its angular nature, resulting in blocky natural terrain. But due to the fact you'll be playing most of JKII in huge spacecraft or enemy bases this is hardly noticeable, and even the few natural environments look nice enough. Gorgeous surface reflections capture the highly polished steel look that many of the Empire spacecraft interiors had in the films and countless recognisable vehicles and installations make appearances, including everybody's favourite, the AT-ST walker.

To progress through the eight different levels, each comprised of three sections, you'll need more than just fast reflexes. JKII is one of the more puzzle orientated first person shooters to have been released in quite some time, so you'll need the intellect of Obi Wan to get anywhere. In fact the biggest flaw of this game could be the difficulty of some of these. Or maybe I'm just really crap at puzzles – I'm one of those people who have never solved a Rubik's Cube. Thankfully, for the most part the puzzles are both innovative and enjoyable, serving to complement rather than detract from the overall gameplay.

All of the enjoyable gameplay and jaw dropping graphical delights are complemented perfectly by a truly epic soundtrack and ear rattling sound effects. It appears the developers were let loose in the Lucas sound studios, as every effect is true to those found in the films. The rich orchestral score based around the familiar tunes of the movies is fully dynamic, changing subtly to suit the situation at hand.

By now it should be obvious to you that the single player rocks, but JKII also has awesome multiplayer. Does the idea of a lightsaber-only battle turn you on? Then you'll love that mode of gameplay. There are also your standard death match and team death match game modes, as well as a few new Jedi-flavoured types. Players can allocate Force points to concentrate on the Light (defensive powers) or the Dark (offensive powers) side of The Force, with a selection of preconfigured classes for the impatient types. Because this game uses the Quake 3: Arena engine, you can be sure the netcode is rock solid, although the maximum realistic player limit for 56K users has been set to 16 to keep gameplay as lag free as possible.

The bundle of joy that is JKII has been developed by the wizards of Raven and LucasArts, so is it any surprise this game is so good?

Both of these companies have solid reputations for developing high quality titles, and JKII is no exception - although quality *Star Wars* titles have been wanting. If you're a *Star Wars* fan, you absolutely, positively need this game. If you're not a *Star Wars* fan, you soon will be after playing this. ○

atomic **9/10**

GAME DETAILS

○ **FOR:** The Quake 3 Engine does it again, lightsabers.
○ **AGAINST:** Can be a tad difficult, a little short.

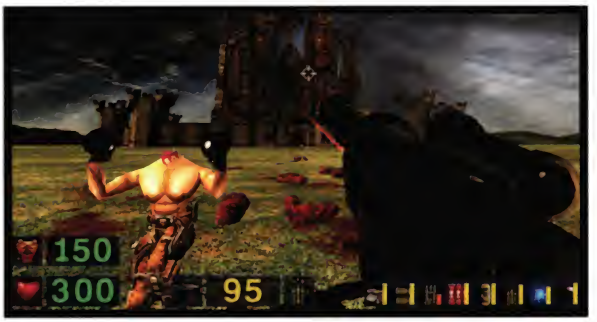
REQUIREMENTS: 350MHz CPU, 64MB RAM, 665MB HD space, 16MB OpenGL compatible video card.
RECOMMENDED: 1GHz+ CPU, 256MB RAM, GeForce2 or better video card.

SOUND APIs: Direct Sound
VIDEO APIs: OpenGL

DEVELOPER: Raven software www.ravensoft.com
PUBLISHER: LucasArts www.lucasarts.com
DISTRIBUTOR: Activision www.activision.com.au
PHONE: Activision (02) 9869 0955

Serious Sam: SE

John Gillooly finds his niche by combining chainsaws with bullfighting.



Rule #69: Try to keep your head while all others around you lose theirs.

Major Bio-Mechanoid with a side order of Zorg Mercenaries.

Why oh why is it always the tastiest weapon in a first person shooter that gets crippled? We have all been there, nursing those precious three seconds of flamethrower ammunition throughout a game, purely because we know that there will never be any more fuel to be found. Ever notice that the really fun weapons like chainsaws are never actually of any use unless your victim is asleep or a wall?

Well fear not, following on from the amazing achievements of Serious Sam, in which developer Croteam almost managed to replace crates with Pyramids as the first person shooter cliché de jour, we now have Serious Sam: The Second Encounter. This is not so much a sequel as a continuation of the original Sam story, taking you out of Egypt and into places unknown.

Not more of the same

This is not to say that Croteam has just whipped up a few more corridors with the occasional lava jumping puzzle either. In an amazingly short amount of time it has managed to beef up the already impressive game engine and add new levels that blow those in the original out of the water. And the lava jumping puzzles are actually fun.

Serious Sam SE kicks with Sam 'Serious' Stone plummeting out of the Sirian space ship that he managed to hitch a ride on at the end of the first game after going toe to toe with the 20 storey tall Ugh-Zan III, crony of the uber-bad guy Notorious Mental. The chase for Mental turns out to have taken Sam to an ancient Mayan city rather than the planet of Sirius. The Mayan area is similar to Croteam's vision of ancient Egypt in that it consists mainly of large open areas packed with hordes of hideous monsters.

Fans of the first game will be happy to know that even though the Pyramids may be squarer and greyer than the original, the gameplay is still the hectic run and gun that sets Sam apart from the rest of the first person shooter pack. Considering the direction in which first person shooters are headed at the moment, it is important to mention that in Serious Sam: The Second Encounter there is no level that puts you in a landing craft approaching Omaha Beach. In fact, the only real reference to anything from World War II is the inclusion of a Tommy Gun as a weapon. That's right, as hard as it may be to comprehend, at no point in Serious Sam will you find yourself fighting Nazis or any other World War II era bad guys.

All the monsters from the original game are there, and more newcomers from Mental's menagerie of hellishly evil critters have joined them. These range from the fairly normal, laser-rifle toting Zorg Mercenary from Beelmez IV to the truly twisted chainsaw wielding, overall wearing, pumpkin-headed Cucurbito The Pumpkin. Despite the inherently chaotic nature of the gameplay, these new baddies are well balanced and add a lot to the overall feel.

In order to fend off these nasties Croteam has delved into the annals of first person shooter history and added three new weapons. While the original already had the requisite shotgun, minigun, rocket launcher and grenade launcher, the second rounds off the collection with a chainsaw, flamethrower and sniper rifle, all of which are actually fun and useful.

Forget rocket jumping or circle strafing, these weapons open up a whole new vista of innovative weapon use. Perhaps our favourite of which is a bizarre combination of chainsaw and bullfighting. Some of the more intimidating enemies in the game are Sirian Werebulls, whose only skill is being able to run really fast in a straight line. Ideally you don't want to get hit by one, because your lifespan will be short, to say the least. But Sam is a real man, and laughs in the face of danger. The best way to deal with it is not to stand back and shoot but stay really still with a running chainsaw, only to sidestep, twist and slice the sucker into werebull steaks as it passes.

The flamethrower also deserves a mention, because it is the first time in a long while that one of these has actually been really useful. It brings a smile to your face when the incoming wave of monsters meet a wall of napalm, and end up falling in crispy nuggets mere centimetres from your feet. And the only thing more fun than chainsawing passing werebulls is doing it while they are on fire.

Take one Fiendian Reptiliod Demon and chargrill with XOP Flamethrower until crisp.

An outbreak of Major Bio-mechanoids in one of the last maps.

'It brings a smile to your face when the incoming wave of monsters meet a wall of napalm, and end up falling in crispy nuggets mere centimetres from your feet.'

Croteam has not rested on its laurels with the impressive engine that was used for the first game. Serious Sam SE uses the same engine, but in the time between games Croteam has thrown in a few tweaks to enhance the visuals. Similarly it is obvious that Croteam is getting more and more adventurous with the engine. The open areas now feature grass and trees, even snow later on, while the indoor levels show some adventurous behaviour with the engine. One level in particular features a series of rooms that get stranger and stranger, including rocking floors and a very special cylindrical room that defies the laws of gravity entirely.

In fact all of Serious Sam: SE is bigger and better than the previous game. Each area brings a new experience, and all the time you are frantically fighting with little time to think. The hordes of monsters are greater and more relentless than before, the diverse environments range from the mountainous jungles of Central America, through the desert paradise of Babylonia to the snowy wastelands of. . . actually that would spoil the surprise.

Croteam does all of this with tongue firmly in cheek. It manages to stay true to its no crate philosophy (however there is rumour of a secret level that puts the hidden crate pyramid in the first encounter to shame), while acknowledging the clichés inherent in the gameplay. This is done largely via Sam's computer, NETRICSA, which provides clues and analysis of puzzles. Often times when you stumble coming a locked door, the incredibly helpful advice will run along the lines of 'the door is locked, guess it is time to turn around and face the inevitable hordes of monsters'.

All the gameplay modes from the first game are there, as well as the Seriously Warped Deathmatch Mod (version 3), which adds even more multiplayer modes for your enjoyment. For those players who have never experienced the original, the game features a full co-operative play mode (including support for split-screen gaming) as well as the ever present deathmatch. Both of these gameplay options add an extra dimension to the experience (co-op especially is an incredibly worthwhile experience).

Serious Sam: The Second Encounter is not the sort of first person shooter that everyone will like. If you are looking for the next great Nazi killing experience then you will be sorely disappointed. But if your main aim is having fun, then Serious Sam delivers it in full technicolour with a wicked sense of humour. ▢

atomic **9/10**

GAME DETAILS

▢ **FOR:** Fun, colourful gameplay.
▢ **AGAINST:** Sadly lacking Nazis and crates.

REQUIREMENTS: 300MHz CPU, 64MB RAM, 3D video card, 150MB HDD
RECOMMENDED: 650MHz CPU, 128MB RAM, 32MB hardware T and L video card, 450MB HDD

SOUND APIs: Direct Sound, EAX 2
VIDEO APIs: Direct3D

DEVELOPER: Croteam www.croteam.com
PUBLISHER: Godgames www.godgames.com
DISTRIBUTOR: Take 2 www.take2.com.au
PHONE: Take 2 Interactive (02) 9482 3455

Star Wars: Starfighter

'The Force is not strong in this one. . .' mutters Des McNicholas

ⓘ No young padawan, this spacecraft isn't bigger than a planet.

ⓘ A basic HUD for a basic game.

Star Wars: Starfighter created waves on its PS2 release and confirmed its status as a premium console title with the Xbox version in the US. Well aware of the selling power of anything branded *Star Wars* (sometimes regardless of quality), LucasArts had always intended a PC variant. While the wait for fans of the series has been shorter than expected, the emphasis on a quick franchise dollar without too much work is sadly evident. Starfighter is primarily a solid console-style arcade shooter, which means those anticipating X Wing Mark II will be more than a little disappointed.

Starfighter is set just prior to the events of *Episode 1: The Phantom Menace*. There are only three ships initially available to fly, with a fourth released through bonus points and fitted with a small range of fairly standard weapons. The short single campaign consists of 14 missions stretched by a half dozen or so bonus flights, and, surprisingly, no multiplayer support is provided.

Starfighter's missions are fought in space and on the surface of various planets (all of which seem to be full of canyons!) with a basic mix of objectives. In the main, they're about destroying waves of enemy fighters or ground installations, and the lack of detailed briefings or planning options sees them degenerate into shoot-outs very quickly. The sheer numbers of the opposition drag missions out over time, and some players will be frustrated with the requirement to complete each level's numerous multiple objectives prior to saving. When combined with the lack of any real ship configuration options and the simple nature of most objectives, the unfortunate result is a game that becomes very repetitive very quickly.

Control freaks need not apply as the game brings very few opportunities to tweak the ships or manage fundamentals such as power supplies and weapon loads. Starfighter flies well as an arcade shooter – although some of the commands don't map particularly sensibly from the console to the PC – and most players should master the basics very quickly. The absence of much useful information in the cockpit is both annoying and surprising: it lacks even the standard radar, and the target cycling system is slow and cumbersome. The ships handle reasonably well in flight, with the brake feature enabling a few tricky manoeuvres and the roll modifier coming in very useful as players literally bounce from canyon wall to canyon wall.

Starfighter's story is pushed along by a series of well scripted and presented cut scenes, although the plot seems disjointed at times and some aspects are a little confusing. The game never really makes the leap from related individual missions to an holistic campaign, and the balance between cut scenes isn't quite right. The final scene, for example, is remarkably short, whereas others of less importance go on forever. Overall, the result is a slightly disappointing experience that misses the mark in capturing the *Star Wars* atmosphere. Even so, the production values of the cinematics are first-rate, using great sounds, visuals and voice acting, supported by classic *Star Wars* music.

Star Wars: Starfighter is a good console title that as per usual hasn't made a great transition to the PC. It offers some fast arcade action but lacks the depth most PC players would have been hoping for, and the limited configuration options significantly reduce its replay value. A great game for the kids but serious fans will probably need to get their *Star Wars* fix elsewhere. ▢

atomic **7/10**

GAME DETAILS

▢ **FOR:** Solid arcade action and a simple interface; well presented cinematics and shallow learning curve.
▢ **AGAINST:** Lacks depth; no real configuration options; some minor control problems; average ground visuals.

REQUIREMENTS: Pentium II 400MHz, 64MB RAM, HDD min 680MB, 16MB Direct3D video card
RECOMMENDED: Pentium III 500MHz, 128MB RAM, 32MB video card

SOUND APIs: Direct Sound
VIDEO APIs: Direct3D

DEVELOPER: LucasArts www.lucasarts.com
PUBLISHER: Electronic Arts www.eagames.com.au
DISTRIBUTOR: Electronic Arts www.eagames.com.au
PHONE: Electronic Arts (03) 9882 1222

MotoGP 2

Des McNicholas unlocks Mick Doohan in the new Legends mode of MotoGP 2.

Squeeze the power on, that's it baby, right there.

Go!!!!! You good things. This here is the best bike game ever.

The original MotoGP was one of the few stand-out titles on the PS2's launch, becoming the SSX of motor sports and convincing players that the PS2 really was something special. We gave MotoGP 9/10 back in Issue 3 and it still plays terrifically well today. Not surprisingly, developer Namco has chosen to build on that success rather than shift from a proven formula, with MotoGP 2 providing improvements around the edges rather than a whole new experience. Additional tracks, new challenges and some extra configuration options combine with enhanced graphics and the same lousy music to bring a worthwhile sequel to a great title.

MotoGP 2 will be instantly familiar to veterans of the original, as it sports essentially the same interface and control features. Six modes of play are available, including Arcade, which allows single races on any of the 10 tracks; Season, pitting players against the world's best riders in a quest for the championship; and the against-the-clock Time Trial mode. Players can also opt for two-player versus mode; a Challenge mode, with over 70 medal winning tests; and the new Legends mode, which unlocks additional champions such Australia's own Michael Doohan. As a complete package, the range of options and the sheer length of play are probably unmatched by other racing titles.

MotoGP 2 brings more of just about everything. The original was criticised for having too few tracks, so Namco has made amends by adding Catalunya, Assen, Le Mans, Mugello and Sachsenring to the starting line-up. The tracks are well modelled, all featuring difficult bends, some tantalising straights and high quality background scenery. Almost 40 bikes are on offer and Namco has used its official licence to include all the world's major teams and riders. The impact seems to be fairly limited, but players can tweak their machines to a reasonable degree by adjusting transmission, general handling, acceleration, brakes and tyres; and a decent number of skins are available.

MotoGP 2 brings three levels of difficulty in arcade mode, while those with more confidence in their riding skills can play it as a simulation. Simulation mode essentially makes everything more sensitive, forcing players to master the art of breaking at the right time, and therefore it's more punishing for over-enthusiastic speedsters. If that's not tough enough for you, then the new weather option should finish the job by causing wet tracks and reduced visibility. Sensitive machines and bad weather make for very exciting races when combined with some challenging new tracks, and the difference between the various difficulty settings adds immensely to MotoGP 2's replay value.

MotoGP 2's controls are straightforward, consisting only of acceleration, braking and direction. Getting the mix right is obviously the key to winning, and most players will spend some time in the dirt just beyond the first hairpin bend. Fortunately, things come together remarkably quickly, and final placings tend to improve as familiarity with a particular track grows. New players will find just staying on the track tough enough at the easy levels, thanks to the temptation to use maximum acceleration at every opportunity, but position and tactics become much more important as the game progresses. Track markings and virtual arrows help with braking and direction, while an eye on the top-down race map provides early warning of impending disaster.

Despite the similar looks, MotoGP 2 is more than just an upgraded version of the original. There are enough technical tweaks to warrant an investment by owners of MotoGP; the extra tracks bring a host of new challenges; and the game is a much tougher beast this time around.

For those new to the franchise, MotoGP 2 has easily assumed the mantle of the best two-wheel racing title available (on any platform) and the reasonably shallow learning curve will ensure that novices quickly master the basics.

atomic 9/10

GAME DETAILS

FOR: High quality; outstanding attention to detail and an awesome relay feature.

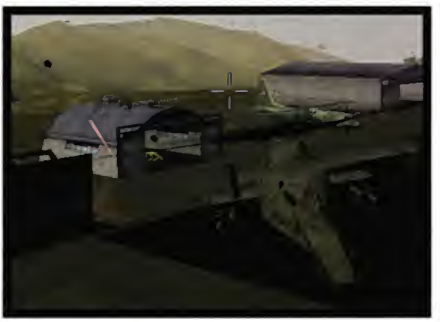
AGAINST: Essentially the same formula as the original - but that wasn't too bad, was it?

DEVELOPER: Namco www.namco.com
PUBLISHER: Sony Computer Entertainment www.scee.com
DISTRIBUTOR: Sony Computer Entertainment www.scee.com
PHONE: Sony Computer Entertainment (02) 9324 9500

Comanche 4

'What's so good about a helicopter so advanced it just about flies itself?' asks Des McNicholas

Comanche 4's cockpits are accurate and well laid out.



Voxel graphics will never die. Polygons suck.

Comanche 4 puts players in the pilot's seat of the US Army's new RAH-66 Comanche attack helicopter, due to enter service in 2006. The Comanche incorporates some amazing technologies to avoid detection and kill targets at all ranges, with systems and specifications that rival most advanced jet aircraft.

Players have the choice of 20mm cannons, Stingers, Hellfires, rockets and artillery to engage aircraft, tanks, air defence missiles and ships, combined with stealth technology and high degrees of automation. There are six single player campaigns, multiplay is supported via LAN or NovaWorld, and a mission editor is included. A short, well presented tutorial covers all the basics, highlighting that there's very little to do other than point and pull the trigger.

Although it lacks the gritty realism of recent flight sims, Comanche 4's cockpit is well laid out and most controls and screens seem to be represented. Control freaks will be disappointed with the lack of interactivity, as just about everything is assisted or automated and configuration options are few, but arcade fans or those that just want a quick burst of action will be underway very quickly. Experienced players can switch off auto-correction for slip, cyclic adjustment (tilt) range, and rotor damage, but that's about it. The HUD display is excellent, presenting an uncluttered view of navigation, time and targeting information, as well as ammunition, damage and threat displays.

The campaigns are wide ranging and based on some reasonably plausible premises: terrorist enclaves, support to other nations, covert operations and general US world police policy.

Unfortunately, Novalogic has missed the mark a little in creating the overall campaign experience, as the missions really pan out as a bunch of loosely related independent operations rather than as part of a bigger picture, and no planning options are provided.

The text-based briefings don't even provide a map and players have no opportunity to select routes or configure flights. Forward Arming and Refuelling Points (FARPS) allow changes to weapon loadouts en-route, but they don't really play much of a role as they could, nay should, have. The result is a game that lacks the immersive sense of participation so important in campaigns.

Comanche 4's environments include desert landscapes, offshore islands and major cities, all of which are sparse but well modelled with plenty of opportunity to make good use of cover and surprise.

Dear old Fort Rucker makes a return appearance for training and everyone from terrorists to tin-pot dictators seems to be armed with Russian and US equipment. Air defence is handled remarkably well, with well-sited launchers posing a major threat on some missions and the AI controlling their fire competently.

Had players been given the opportunity to view reconnaissance data and plan routes to avoid air defence assets, this aspect of the game could have been first class.

Comanche 4 is great fun as an arcade title and probably represents a good starting point for novice players keen to get into flight sims. It looks and sounds terrific and some of the individual effects – like rotor wash over water – are first rate. Interestingly, many of the automated features included are available to real pilots today, making decent campaign structures and planning options even more important in a game – maybe Comanche 4 is just too good a simulation of the real thing!

atomic **7.5/10**

GAME DETAILS

FOR: Great effects, GeForce4 Ti feature support, simple learning curve and solid multiplay.
AGAINST: More arcade than simulation; not enough to do; no mission planning options. Poor mission editor.

REQUIREMENTS: Pentium II 450MHz, 128MB RAM, HDD min 190MB, 16MB DirectX compatible video card.
RECOMMENDED: 800MHz-1GHz, 256MB RAM, HDD 500MB, 32MB video card

SOUND APIs: Direct Sound
VIDEO APIs: Direct3D

DEVELOPER: Novalogic www.novalogic.com
PUBLISHER: Electronic Arts www.eagames.com.au
DISTRIBUTOR: Electronic Arts www.eagames.com.au
PHONE: Electronic Arts (03) 9882 1222

Headhunter

'But I don't want to change jobs!' protests Des McNicholas.

Why oh why do bad guys always need to wear gas masks?

Jack's shooting skills make the baddies green with envy.

Released in Europe a short time ago on the ill-fated Dreamcast, Headhunter has made the transition to the PS2 for the US and Australasian markets. The Dreamcast version is still a standout title on that platform and Sega has done an excellent job changing formats. Largely unheralded prior to its release, Headhunter is an exceptionally well presented game that combines a decent story with terrific action, an immersive atmosphere and a strong sense of humour. The slow start and high levels of difficulty will discourage some players, but Headhunter is well worth the effort for those with the fortitude to see it through.

Headhunter throws players into the role of bounty hunter Jack Wade, chasing criminals for the Anti Crime Network (ACN). ACN is essentially a privatised police force, charged with hunting down wrongdoers and bringing them in with their organs intact. Vital organs are a key part of the economy in the Earth of the future, in which virtually everything has been contracted out, and the ACN reigns supreme. Recovering from an opening scene shoot-out and a bout of amnesia, Wade finds himself out of a job and on the trail of his boss' killer. His first objectives include getting friendly with Angela Stern, the bereaved daughter, and acquiring a new hunting licence.

Headhunter is a long and involved game that makes maximum use of cut scenes and in-mission updates. Wade uses a motorbike to traverse the large game world, alternating between adventure-style searching and fast-paced shootouts. Breaks from the plot are provided via regular trips to the Law Enforcement Intelligence and Licence Approval (LEILA) offices, where players undertake training against virtual-reality targets to upgrade their licence and learn the basics of controlling Wade and his arsenal. The cut scenes are well handled and graduating from LEILA adds to the plot rather than getting in the way.

Sega has implemented a straightforward gamepad control system that players will master very quickly. Wade moves reasonably smoothly and the automatic loading and tracking features help the frantic combat sessions. His ability to creep along walls and lean around corners is exceptionally well implemented, although the lack of a jump option slows things down a little at times, and a simple peek feature would help. The initial tutorial covers all the main moves and LEILA rounds things out as the game progresses. Orientation is a little tricky at first, as the camera tends to pan in unexpected directions, and some players will find the slightly off-centre perspective unusual.

Headhunter joins a small group of recent action titles – including Max Payne and Medal of Honor – that have tried to blur the distinction between game and cinematics. It's arguably not as successful as either in dragging players into the game, but Headhunter still does an excellent job of using sights, sounds and cut scenes to build up a terrific atmosphere and a real sense of story. The newscasts are excellent, slowly establishing a picture of a society gone mad, while having a good dig at the real networks in the process. Voice acting is better than average throughout the game, with the conversations driving the plot along nicely and providing plenty of laughs.

Headhunter is a third-person shooter that improves on most aspects of the genre and introduces some interesting adventure-style twists. The production values are first-class, ranging from high quality models and cinematics to impressively orchestrated music and sounds. Some players will find the storyline a little overbearing at the expense of action, but the frantic nature of the combat, the regular LEILA breaks and the need to solve some clever puzzles offer a great experience. Headhunter is more suited to long-term commitment than quick bursts of action (although LEILA can be accessed separately), and it probably has limited replay value. It still deserves to be a major 2002 success story.

atomic 9/10

GAME DETAILS

FOR: Well presented, great atmosphere and compelling story; great sense of humour.

AGAINST: Possibly a little too hard at times; limited replay value.

DEVELOPER: Sega www.sega.com
PUBLISHER: Sony Computer Entertainment www.scee.com
DISTRIBUTOR: Sony Computer Entertainment www.scee.com
PHONE: Sony Computer Entertainment (02) 9324 9500

Sid Meier's SimGolf

Combining golf clubs and the Sims is just too much temptation for John Gillooly.

Strangely enough, tiny golfers start complaining when having to wade through water

Torturing your Sims with terrain is a load of fun

Maxis is the designer drug lab of the computer gaming industry. No one knows the exact formula for its success, but the hordes of red-eyed Sims junkies attest to the fact that it creates export quality products. It is easy for the jaded gamer to look upon the Sims and wonder what the attraction is, while the rest of their family happily whittles away hours trying to develop virtual domestic bliss.

The latest narcotic from Maxis is Sid Meier's SimGolf. Developed by Firaxis, maker of Civilization III, this collaboration between SimCity creator Will Wright and Civilization father Sid Meier has been a long time coming, and the announcement that it would be a golf course designing game disappointed a lot of people.

But fear not, the end result is something special. The premise behind the game is that you have been endowed with a large inheritance, with the stipulation that you use the money to build the world's greatest golf course. Starting off with a small plot of land in one of four different environments, you go on to build the course up with the ultimate aim of producing an 18 hole classic. Spice is added to this by the eternal Sims theme of keeping the populus happy. The most fundamental method for doing this is by designing a challenging and enjoyable series of holes, but there are numerous cosmetic techniques as well.

SimGolf uses a slightly modified version of the normal Sims engine and suffers slightly from this. Other issues include the 800 x 600 resolution game world, which revolves around a regular square grid, hindering the freedom of course design. This irritant is soon dwarfed by the complete lack of a time acceleration option: as the game involves long periods of money raising, watching people play your course soon gets tedious.

Engine issues aside, SimGolf delivers an incredibly enjoyable gaming experience. Golf course design is not as easy as it looks, but once the basics are learnt there is an amazing amount of tweaking to do. The game rewards course design that mixes challenges: a good course will combine holes that require long shot lengths, accurate hitting and imaginative shots. Your success can be gauged by the reaction of golfers, but the best way to find out is by playing the course yourself.

You have a personal Golf Pro for each course who is a multi-tasking, golf playing groundskeeper, ranger and drink vendor. You can take your Golf Pro out for a round on the course you've been working, played through a highly simplified, yet enjoyable, two-dimensional golf game. It is hard to describe the experience, but with access to drives, fades, backspin shots and low punches you get to play most of the hole – putting is done automatically. As your course develops, you attain certain goals that give you skill points to allocate to your Golf Pro, and skills are also developed by pulling off tricky golf shots.

A host of very Sim stuff happens as the course expands: people join your club, tournaments are held, problems crop up, players fall in love. . . and you keep screaming for that time acceleration feature. Expansion means that your Golf Pro can no longer handle the day-to-day tasks, and extra staff must be hired to help. For instance, despite what we learned from *Caddyshack*, the main biological threats to golf courses are not gophers but dandelions, which must be kept at bay by a groundskeeper.

There is more depth to the game than you think. Golf course design may not seem like a riveting gameplay concept, but it works: you'll soon find yourself wondering whether the next hole should dogleg, or how nasty you can make a water hazard to inflict on your Sims. Golf may be a good way to ruin a nice walk, but it doesn't ruin a nice game.

atomic **8.5/10**

GAME DETAILS

FOR: Innovative, addictive gameplay; easy to get into, but with increasing depth.

AGAINST: Lack of time acceleration; hindered by graphics engine.

REQUIREMENTS: 233MHz CPU, 32MB RAM, 4MB video
RECOMMENDED: 500MHz CPU, 128MB RAM, 4MB video

SOUND APIs: Direct Sound
VIDEO APIs: DirectX

DEVELOPER: Firaxis www.firaxis.com
PUBLISHER: Electronic Arts www.ea.com
DISTRIBUTOR: Electronic Arts www.ea.com
PHONE: Electronic Arts (03) 9882 1222

«WELCOME TO MY WORLD»

TONY HAWK'S PRO SKATER 3™

Screenshots from the PC CD Rom version

Enter the ultimate skater's world. Weave through traffic, avoid annoying pedestrians and cause natural disasters as you shred through 8 massive living levels in the ultimate skating challenge. Master new tricks and check your skills by taking it online against your friends across town or around the globe. Welcome to my world.

M15+

PC CD ROM

XBOX

NEVERSOFT

ACTIVISION O2

SPORTS REVOLUTION

ACTIVISIONO2.COM

World War II Online

Bennett Ring just can't seem to get enough of that Nazi lovin'.

I'm punching out, Maverick!

The old line of superglue trap claims another victim.

In case you hadn't heard, the US launch of World War II Online was about as trouble free as that of the last Space Shuttle Challenger lift off. The buggy game code was almost as troublesome as the severe lack of servers, which were inundated with far more subscribers than the developers had expected. Thankfully it seems that most of the bugs were ironed out and more servers provided before this title was launched in Australia. So how does the new and improved WWII Online play?

Before we can talk about how good or bad this game is, it's interesting to note that this game is the closest you can get to participating in a real WWII battle without having to mod your Delorean with a Flux Capacitor. Depending on how you like to deal death to your opponents, you can play the role of pilot, tanker, seaman, gun crew or infantry soldier in a thriving online battlefield. Thousands of players at a time battle it out in a half size map of Europe, waging war to control important cities and resources.

As such it can get pretty damn complicated, which is why there is a distinct chain of command. Before playing the game it's wise to spend a couple of days reading up on the Order of Battle of your chosen side, axis or allies, figuring out what the higher ups want you to do, and some research into the tactics to use for your chosen role won't go astray either. To become one of those who get to send others to their virtual deaths you'll need to successfully complete missions or capture objectives that are laid out in the various planning screens.

Each side is limited to using the real world weapons that were in use during the time period being played. Currently the war is set in the Blitzkrieg campaign of 1940, but over time the game will progress to the later stages of the war, keeping the gameplay fresh via the injection of new units to control. Once you've figured out where you're needed most it's time to hit the battlefield.

The landscape graphics are quite simple by necessity, but it certainly isn't an ugly game. Today's PCs simply don't have the power to provide highly detailed landscapes as well as far reaching horizons allowing you to spot the enemy long before you can blow him away. Vehicles and buildings are quite detailed but are let down by the Lego figurines that represent infantry. When it comes to the handling of the vehicles, the physics are a bit hit and miss. Tanks, AT guns and ground vehicles all feel superb, while the fighters and bombers have a worrying arcade feel to them. As a flight simmer from way back, it was obvious after a few flights that the flight models are nowhere near as detailed as those in standalone sims. Considering all of the servers are based in the US, and the huge number of players in each battle at one time, it's surprisingly lag free, although we tested on a broadband connection.

WWII Online isn't the sort of game you can just jump into for a quick blast; it's going to take several weeks before you get the most out of what this game has to offer. Because of the emphasis on teamplay, a thriving community supported heavily by the developer exists, with regular newspaper style updates on recent battles and tactics. WWII Online is not without its fair share of problems – expected for a game of such scope – but these are slowly being resolved over time. It also isn't the cheapest of games: at $20 per month plus the initial purchase price it's going to be too costly for many. But if you like your games to have the depth of the Mariana Trench, and don't mind paying a monthly fee, you'll find that World War II Online is well on its way to becoming the definitive online war sim.

atomic **8/10**

GAME DETAILS

FOR: Massive scope; incredibly deep gameplay.

AGAINST: Slightly unstable; iffy aircraft handling.

REQUIREMENTS: Pentium III 600MHz, 256MB RAM, 32MB 3D Video Card; Internet Access
RECOMMENDED: 800MHz, 256MB RAM, GeForce DDR level video card, Broadband

SOUND APIs: Direct Sound
VIDEO APIs: NA

DEVELOPER: Cornered Rat Software www.corneredrat.com
PUBLISHER: Strategy First www.strategyfirst.com
DISTRIBUTOR: GameNation www.gamenation.com.au
PHONE: GameNation (02) 8303 6838

FEBRUARY GAMESPY.COM RATED WRECKLESS 86%

Face off with the Yakuza mafia as a cop or spy, pulling off 20 tough, high-speed driving missions through the chaotic streets of a fully interactive, fully destructible city. Unleash real-time damage in one of 10 vehicles—from sports cars to a monster truck—then relive the action in stunningly realistic replays.

WRECKLESS
The Yakuza Missions™

Enter to win an Xbox™ video game system at

GOWRECKLESS.COM

"...arguably the most exciting, technically demanding, and amazing-looking driving game ever made."
— OFFICIAL XBOX MAGAZINE (JANUARY 2002)

XBOX™ | BUNKASHA GAMES | AUSTRALIA G8+ | ONLY ON XBOX | ACTIVISION

activision.com

Etherlords

Fancy another card game? 'I'm hardly Russian, thanks', says George Soropos.

"Behold! I am the human peacock!" "Yeah? It looks pretty small from here."

Observe this Russian game's environmental influences.

Etherlords is yet another one of those surprisingly good titles to appear unheralded from eastern Europe, this time from Russia. In between queuing up for Beatles LPs and reading the latest copy of *What Potato* magazine, the programmers at NIVAL have somehow found the time to develop a unique little strategy game for fans of the Heroes of Might and Magic PC game series and the Magic the Gathering card game.

In the campaign game the action takes place in a sumptuous 3D environment that looks a little like Heroes 4 with added lushness. Combat is also handled in a similar way to the Heroes titles: when a fight is initiated you're taken to a combat screen where you and your enemy face off in a one on one duel. The basis of your mission on each map is to protect your main Castle and destroy one or more of the enemy's Castles, by going through his Heroes of course. The campaign mode game play is set up in two story arcs with two races shared by each arc. It would have been nice to choose one of the four races then play it through from start to finish, but this way is a little different from the norm and therefore an interesting addition to the usual formula.

Your heroes derive their power from their special abilities and the spells which are powered by Runes. This is where the card elements come into the game. Your spells are essentially your cards and how you play them is the crux of your battle strategy. At the start of each mission your Heroes have a basic complement of spells and no special abilities. New spells can be found at different places on the game map and cost resources to buy. But they also need Runes to power them, and these must be bought from other specialist buildings or looted from strange looking boat things that are found around the game maps.

When in combat the spells available to you are determined by a combination of how much power you have and random chance. Your spell power builds up over time and with the help of some enhancing spells, but the major worry always present in this style of fighting is the chance element. It might come down on your side and not give your opponent access to their best spells or it might hurt you and keep throwing up useless spells turn after turn, so even when you think it's going to be an easy fight against a lower level opponent, you never know what might happen. This, depending on your point of view, is the beauty of card style combat. You never feel safe! But it is a matter of taste and some gamers don't like feeling they're not totally in control.

There are eight Heroes style resources to manage in the game which can be used to buy spells and runes and to upgrade or build structures like forts. Of course, by denying your enemy access to these resources, you'll weaken him considerably and therein lies the main strategic challenge on the game maps. As with Heroes, if you allow your opponent too many resources and too much time, he'll swamp you with forces too powerful to contain.

The other mode of play is Duel mode which simply involves combat, with no movement on the game map. You are able to set up your avatar with a custom deck and runes to take on a PC opponent, or challenge someone online. Duel mode is the only mode available for online play. There is also a skirmish type single mission option. Heroes fans used to being able to keep their best Heroes at the end of missions will be disappointed at not being able to do so in Etherlords. The game was not designed to support high level characters so you have to start from scratch every mission.

Etherlords is not a game to suit everyone's tastes, but if you're impatient for Heroes 4, it's at least worth a demo download to see if it's your cuppa.

atomic **7.5/10**

GAME DETAILS

FOR: Unique blend of HoMM and Magic the Gathering style gameplay.

AGAINST: Card style combat a matter of taste and can leave too much to chance; can't carry heroes over.

REQUIREMENTS: Win95/8/Me/XP, Pentium II 300MHz, 64MB RAM, 8MB AGP card, 4X CD, 1.4GB HD
RECOMMENDED: Pentium III 600MHz, 128MB RAM, 32MB video, 32X CD

DEVELOPER: NIVAL www.nival.com
PUBLISHER: Fishtank Interactive www.fishtankgames.com
DISTRIBUTOR: Red Ant www.red-ant.com.au
PHONE: Red Ant (02) 9882 1222

THE IT DIRECTORY

Trying to find a product or service? Look no further.

Go to www.atomicmpc.com.au/dealers.asp?mode=1 to find the details of the following resellers, manufacturers and distributors, plus many more. The site lists the Web address, company address, phone, email and fax.

Our Web site will help you to find that elusive product, the ideal reseller, manufacturer or distributor of a particular brand; or simply a product type.

If you know what you are looking for, you can search for the most convenient place to buy it or simply research the options available to you. It's up to you how tight you set the criteria: you can do an advanced search and cross-reference by product, postcode, brand and so on. So quick and simple you'll wonder how you ever did without it!

- 3CO
- Abet Computers
- Access 1
- ACCO Australia
- Accord Technologies
- Acer
- Activision
- A Drive Computers
- Allteq Pty Limited
- Amexcom
- Another World Computer Centre
- Ailean Technologies
- Alphazone Computers
- ARC Computers
- Aspen Tech
- ATF Computers
- AusPC Market
- Austin Computers
- Australia Computers Online
- Australia IT
- Australian Computer Recyclers
- Australian Network Solutions
- Autodesk
- AV Computers
- Below Zero
- Best Byte
- Bevdan Business Services
- Bitronics Computers
- Bits & Bytes
- BITS Computer Graphics
- Bitstorm
- Brimar Electronics
- Briter Comuters
- Brother International
- Cam1 Computer Wholesale
- Centercom Computers
- CIP Computer Solutions
- Compaq Computer Australia
- Complete Peripheral Services
- CompuEdge Pty Limited
- Computer Cyber Shop
- Computer store @ Newport
- Computer Troubleshooters
- Computer Warehouse
- Computers 4 Less
- Connect U Up Computing
- Connexus Internet
- Cool PC
- Cougar Computers Canberra
- CR Computers
- Creative
- Creative Zone
- Crossys Computers & Electronics
- CW Supplies
- Cyberdec Australia
- Cybertech Consulting
- Cybus Computers
- Cydex Computers
- D Link Australia
- Dell
- Dlife
- DNAML
- Dot Systems
- Duncan Computer Services
- DX Computers
- EBM Computers
- Electronic Product Warehouse
- Emagen
- EPSON
- EYO Technologies
- FNQ Computers
- Focal Point Computing
- Forte Computers Publishers (Aust.) P/L
- Fuji / Hanimex
- Games Warehouse
- GCC Technology
- Gigaworld Computer Systems
- Go-Xtreme Tek
- Griffler Enterprises
- Guillemot
- Hallmark Computer International
- Hewlett-Packard
- Hitachi Australia
- Hollywood 7 Computers
- HP Paradise
- Impact Systems Technology
- IMSI (Australia)
- In Learning
- Ingram Micro
- INKme
- Inktec Australia
- Innovision Technology Australia
- Integrity Data Systems
- Iomega
- I.T2 The Max
- IT National
- Jack Of All Games
- Jim's PC
- Karana Computer Systems
- Kingston Technology
- KM Computer Systems
- Kodak Digital & Applied Imaging
- LaCie Australia
- Landmark Computers
- Landmark IT Resources
- Lanyon Computers
- Laptop Land
- Leader Computer Systems
- Leading Pacific Australia
- Lemurian Technologies
- Lexmark
- Lidcam Technology
- Loucra Computers
- Mac Troubleshooter
- MacroMax Computers
- MacSense Australia
- Mates Rates Computers Services
- MAUS
- Maxtek International
- Maxwell Optical Industries
- MegaPC
- Microdirect
- Micropaq
- MicroStar International
- Microstructure Computers
- Microtech Corporation
- Mindflux
- Mitsubishi
- Mobile PC Workshop
- Modtech
- Multimedia Technology
- Navada Computer Services
- NETGEAR
- NetPlus Micro Computers
- newcomputers.com.au Box Hill
- newcomputers.com.au Oakleigh
- NoLimitz Computers
- Nortec Computers
- Notebook Solutions
- OA-Link
- Ocean Office Automation
- OKI
- One Group Computers
- Online Marketing
- Organiser World
- Overclockerz Supplies
- Oztec Computer
- Palmwoods Computers
- Panasonic
- Parramatta Computers
- PAW Products
- PC Case Gear
- PC Case Mods
- PC Cooling Australia
- PC Extreme
- PC Repair Centre
- pcXtra Computers
- Peakhour
- Performance, Memory and Peripherals
- Perpetua
- Philips
- PICA Software
- Pioneer Computers
- Point Computer Systems
- Proven Technologies
- Pullman Computing
- Punch Technology
- Purpose Built Computers
- QD Innovative Computer
- Questek Components
- Rectron Electronics
- Ricoh Australia
- RTV Computer
- Sage Distribution
- Samsung
- Santacom Computers
- Sanyo
- Sasquatch Solutions
- Sato Enterprises
- Scorpion Technology
- Shane's Micros
- Sharp
- Short and Tall Computing Services
- Silicon Memory Technologies
- Sony
- Speedcom
- Surplus Computer Products
- TEAC
- TeamLink Australia
- Techno Magic
- Tech Pacific
- The Cartridge Man
- THX – The SONY I.T Store (Parramatta)
- Toowoomba Computerland
- Toshiba
- Trinix Computers
- Tweak Town Shop
- Viewsonic Australia
- WB Gamezone
- Western Computer Networks
- XClusive Software
- Xenon Systems
- Yamaha Music

Star Trek: Armada II

The latest Trekkie RTS might have its graphics set to stun but was Des McNicholas assimilated?

Large numbers of units can appear on screen at once, making for frenzied battles.

An example from the Romulan's overlooked Art Deco period.

Star Trek games have had a chequered history on the PC, with most failing to live up to players' high expectations. Those games opting for traditional RTS elements were criticised by ardent fans for ignoring the complexities of the Star Trek universe, while genuine attempts to recreate the atmosphere of the series were doomed to condemnation by the resource-gathering elite. Despite being a fairly conventional RTS at heart, the original Star Trek: Armada cornered the niche Trek market by wrapping a mix of depth and management in a reasonable story and presenting it through an interface that satisfied the Trekker's desire to take control. Activision's Star Trek: Armada II introduces a 3D environment, new races and vastly improved multiplay, but players may be disappointed that it hasn't boldly gone much further than the original.

It's now six months since the Borg were pushed out of Federation space, and Starfleet has been put on the offensive in the Delta Quadrant to finish the job. The Klingons, Romulans, Cardassians and Ferengi all have a stake in the result, and the mysterious Species 8472 has plans of its own. The Federation, Borg and Klingons have single player campaigns each, with the Romulans, Cardassians and Species 8472 available for multiplay via LAN, Internet, and GameSpy Arcade. As in the series, the Ferengi are focused on trade and Armada II relegates them to NPC status.

Armada II puts players in command of battle fleets spanning the Star Trek universe, with responsibility for resource gathering, construction, trade and tactics. Resources in this case include dilithium for warp drives; metals for ship building; gold covered latinum for those unexpected purchases; and the bio-matter unique to Species 8472. Crew and officer pools must also be established at planets and Starbases, and Species 8472 needs pilots to control its organic ships and stations. Although resource gathering remains relatively straightforward, the process is certainly more involved than in the original game and some players will find it frustrating over the long haul.

Armada II's well designed interface provides good levels of situational awareness and the ability to jump quickly to the action. Fleets and individual vessels are easily controlled and the 3D engine opens up some new tactical opportunities by allowing ships to operate at different elevations. The improved look is supported by an enhanced camera system, although the difficulty of identifying the enemy has been carried over from the original game and players will probably use the tactical 2D view most of the time. On balance, the move to 3D and the introduction of elevations hasn't had much impact on the way Armada II plays, and does very little to foster a unique Star Trek experience. It's well executed but standard RTS fair, with victory generally coming down to the traditional quick build and mass attack tactics.

Armada II's single player campaigns are competently handled, benefiting from comprehensive briefings, reasonable variety, and the familiar voice-overs of Next Generation actors. Players will be pleased to see the game really outshines the original in the Instant Action and Multiplay Modes, by providing a host of configuration options and a simple interface. Both modes allow resource gathering to be ignored if preferred, and the ability to declare a ceasefire for a period at the start of the game encourages some serious fleet design. Multiplay will be the saving grace for Star Trek: Armada II, and may well be reason enough for fans of the original to spend a little more money.

atomic **8/10**

GAME DETAILS

FOR: Excellent instant action and multiplay; well designed and presented campaigns; and a solid interface.

AGAINST: Not much to separate it from the original; lacks the Star Trek atmosphere.

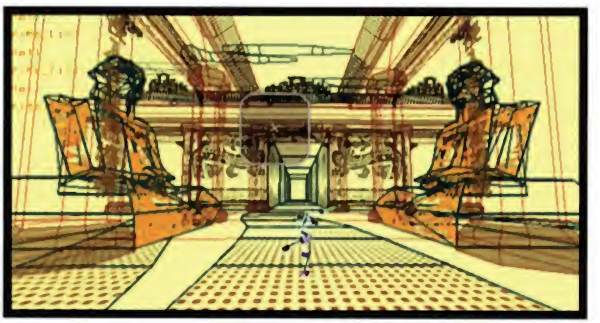
REQUIREMENTS: 450MHz CPU, 64MB RAM (128MB Multiplay), HDD 1.4GB, 8MB DirectX video card.
RECOMMENDED: 500MHz CPU,128MB RAM

SOUND APIs: Direct Sound
VIDEO APIs: Direct3D

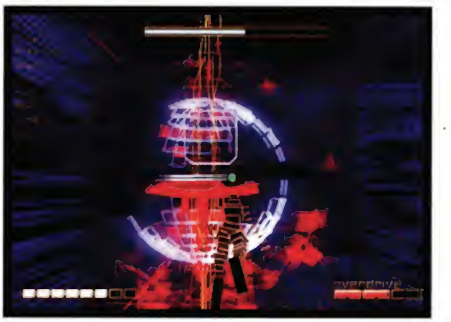
DEVELOPER: Mad Doc Software www.maddocsoftware.com
PUBLISHER: Activision www.activision.com.au
DISTRIBUTOR: Activision www.activision.com.au
PHONE: Activision (02) 9869 0955

Rez

George Soropos is too fried to sort a goodie from a baddie – so he necks the lot.



ⓘ Everyone's worst nightmare, being stuck in an architectural drawing.



ⓘ Did anyone mention this game was pretty trippy?

Rez made its first appearance on Sega's wildly successful Dreamcast console over a year ago and helped it attain the sort of record sales that saw the machine go from console to set top box to door stop in record time. But seriously, Sega's ability to come up with interesting, original and just plain whacky software has always been its main strength. Now that the DC is out of the way Sega can concentrate on what it does best.

So what is Rez all about? It looks like an old school vector/16-bit polygon based shooter and in a sense it is, but for those of you who are musically inclined Rez offers something more than just blasting Godless sprites. Named after one of the most ecstatic tunes ever written by Brit stadium ravers Underworld, the game was apparently designed to appeal to today's generation of asthmatic, hyperactive, ADD-ridden, glue sniffing gang members, otherwise known as young people. They saw those ads years ago: 'This is your brain on drugs' and thought 'Cool, let's try it!' And in the finest traditions of the free market many new products have appeared to take advantage. 'Smart' drinks and energy drinks are the most obvious example, and now Rez!

The hippy drippy graphics can be quite effective in the right situations, and certainly original. The gameplay can be simplicity itself, depending on how you choose to work it. If you're only interested in the shoot 'em up aspects of the game then all you have to do is put the bad sprites under your target cursor, hold down the fire button and let it go. If you want to get fancy you can hold the fire button down and drag your target cursor over up to eight targets simultaneously, and then let it go. All the targeted bad guys will then be blasted back to pixel heaven.

However, if you want to get the most out of Rez you have to delve into its musical nature. It's usual for a game to have a soundtrack playing in the background but with Rez that soundtrack is actually part of the gameplay. Each time you blast an enemy a note is played that sits in the same key as the soundtrack. In other words, you can use your gun as a music sequencer, blasting riffs that sit over the soundtrack! If your timing is good you can create many new permutations as you fly through the levels. Each stage in the game is short and brings on a crescendo type effect, so that the soundtrack gets bigger and fuller with each new level.

The intensity of the action also increases with each new level with more and more enemies after your transparent butt. In true arcade tradition there are also bosses at the end of certain levels which must be defeated before you can move on. These guys are as big and mean as bosses should be and should be taken out with the help of the power-ups available. The Overdrive ability allows you to blast away with greatly increased firepower so you can really unload on the big muthas. The other power available to you is the ability to evolve your alter ego by blasting the little blue globs that appear from time to time. Each time your character evolves he gets a new look, stronger armour and a more powerful weapon – but if you take a hit you get knocked down one level each time.

Sadly Rez does not have a multiplayer mode, and considering the very light work load on the hardware it isn't because it was impossible to do. What it does have is traveling mode. In traveling mode your character doesn't take damage from your enemies and so it allows you to just cruise through the levels at your pleasure. This is the mode to play in when you're really, really knackered after too many mind altering substances. Keep a bucket handy.

So next time you're plopped on the couch, head buzzing from a long night of loud music, overpriced bourbon and a kebab banned by the Helsinki Protocol against chemical warfare you might want to have a copy of Rez handy. Well, you'll probably be a lot more interested in having Shakira or J-Lo within arm's reach, but barring that, go Rez. ○

atomic **7.5/10**

GAME DETAILS

○ **FOR:** Gives you something to do when you get home from the disco. . . alone.

○ **AGAINST:** Simplistic gameplay that makes Diablo look like Harpoon 4; no multiplayer mode.

DEVELOPER: UGA
PUBLISHER: Sega www.sega.com
DISTRIBUTOR: Sony Computer Entertainment www.sonyinteractive.com.au
PHONE: Sony Computer Entertainment (02) 9324 9500

Hi hoe, eye o

Daniel Rutter engages Compassion Mode and unleashes the full fury of his TechSupportBot. There's more to learn in these pages than in the complete works of How it Works. Possibly. LOTM scores the bloody marvellous Enermax EG465P-VE 430W PSU that Atomic gave a Hot Award to in issue 13. We're extremely very grateful a lot to the good people at www.pccasegear.com.au (03) 9572 3444 for this lavish prize.

i Letter of the month: Meandering electrons

When I try to install Return to Castle Wolfenstein on Windows XP Pro, I get the following error message: 'An I/O error occurred while installing a file. This is normally caused by bad installation media or a corrupt installation file'. Here's how I've tried to fix this problem:

1. Check the game CD to see if it's scratched; not even a fingerprint or a speck of dust.
2. Install it on all hard drives; still the same error message.
3. Run Scandisk on all hard drives and reinstall; no errors on the drives, and yet the same error message.
4. FDISK and reformat the hard drive; no good.
5. FDISK and reformat the hard drive and install Windows 2000; same problem.
6. FDISK and reformat the hard drive and install Windows ME; same problem.
7. Create a backup of the CD, then use the backup to install; same problem.
8. Install it on the other computer in my home; works perfectly!

I have tried everything in my power to bypass this installation error. And yet, it still haunts me. Please, how can I install this game and run it without these problems? I've spend all day trying to figure this out, and it's killing me.

Onur Yetiz

O Since there doesn't seem to be anything wrong with your CD, it could be software running on your PC that the installer is tripping over. This error message is more often caused by software conflicts than by 'bad installation media or a corrupt installation file'.

If you're running a virus checker, quit it before you try the install. There may be other background apps that are locking files the installer wants to look at, too, but I'd suspect anti-virus software first.

Otherwise, if you can, try the game CD on another PC, thus following the golden 'trial and error' route to PC problem solving.

i Startup twiddling

I upgraded to Windows 2000 a couple of months back. Problem is I've spent as much time as I can since that installation trying to discover how I can alter my system startup. Wanna help out?

Michael Johnson

O If you want to change the apps that load on startup – little System Tray thingies, and such, then go to Start -> Run and type 'msconfig'.

The Startup tab in that application lets you elegantly disable and re-enable run-on-startup apps. If you disable an app and reboot and then things go weird, you can just re-enable it again, easily. You can similarly play with the lower level startup files, but you probably don't need to.

i Overclocking equipment?

I've had my Duron 900MHz for a while now and I'm starting to get bored with the speed and I wanted to overclock it to maybe around 1GHz. I'm a little scared that I might make the computer go up in a cloud of smoke. I have an AOpen AK73 Pro mobo.

Ryan Lewis

ABOVE: 1GHz is an easy overclock for a 900MHz Duron.

Send your questions to I/O@atomicmpc.com.au or by post to: I/O Atomic PO Box 275 Beaconsfield NSW 2014

'The super-small track spacing in current drives – tens of thousands of tracks per inch – means that tiny wobbles or misalignments between the platters and the heads will cause problems.'

You don't need to buy any fancy gear for basic overclocking, provided you've got a motherboard that makes it possible – and you have. You do need decent case ventilation, but you need that for stock-speed computers, too.

If the power supply fan is the only thing sucking air through your computer case, add another fan; most cases have a standard mount for an 80mm intake fan at the front.

To get 1GHz out of a 900MHz Duron with 100MHz standard Front Side Bus, you just have to goose up the FSB to 111MHz or 112MHz. Such a small overclock is unlikely to make a noticeable difference to anything, but it's also likely to work on most CPUs at stock voltage. If it doesn't work at stock voltage, a 0.05V core voltage increase – which you can also do with your motherboard – should be enough to get it running stably.

At about 1GHz, your CPU won't be creating much more heat than normal, even at slightly increased core voltage. Any CPU cooler that worked with the stock-speed Duron should be fine with it at 1GHz as well. The other hardware in the computer shouldn't have a problem with a mild overclock like this, either.

One-drive RAID?

Why don't hard drive companies make drives with 'internal RAID' functions?

Hard drives have more than one platter, and more than one read/write head, so you'd think they could read or write from more than one platter at a time. I know that the head assembly's one piece, so the heads can't move independently, but they could still all do stuff at once and read or write to a whole cylinder in one go, couldn't they?

ABOVE: 'Why can't all of these heads work at once?'

Pretty much no drive in existence can read or write with more than one of its heads at a time.

Drives that can use more than one head at a time have been made: Seagate had a two-heads-at-once Parallel Transfer Drive (PTD) Barracuda model some years ago, the ST12450W 2 Head Parallel (2HP).

PTDs can read or write both sides of one platter at once.

Soon after, Seagate rejoined the mainstream and switched to simply using monster data density and high rotational speeds to get better performance than the PTD could manage.

A PTD with this same improved tech would of course still have a performance advantage over one-head-at-a-time drives with the same speed and data density, but it would be expensive.

Multihead drives need a separate read channel, write channel, microsequencer and DMA path to their RAM for every single head you want to work at once.

These components are not free.

If you've only got a one-head-at-a-time drive, you'd think you could at least switch heads really fast and do some sort of interleaved RAID thing. Unfortunately, you can't.

The 'head switch time' needed to change from looking at one side of a given platter to some other side, or some other platter, even without changing the cylinder (i.e. without moving the head armature) is somewhere in the vicinity of one to two milliseconds.

The maximum rotational latency (single revolution time) of a 7200rpm drive is 1/120th of a second, 8.3 milliseconds; that's the longest amount of time a head can possibly stay waiting for the disk to spin around and bring the right data to it.

If a transfer operation has to wait most of that time for the next sector it's interested in to come around, then putting that sector somewhere else on the cylinder, closer rotationally to the one just accessed, would make sense, even if it meant you had to switch heads.

But with several hundred sectors per track on all current drives, rotational latency from one sector on a track to the next for plain non-fragmented contiguous writes is, of course, minuscule, and far lower than the time needed for head switching.

The fastest way for a one-head-at-a-time drive to operate is, therefore, to store as much data as possible in contiguous sectors of one track, then do the same thing on other tracks of the same cylinder, and then move to a new cylinder only when it's out of space on the one it's using.

Another problem arises if you try to make a hypothetical multi-platter, all-heads-at-once drive read and write from more than one platter at a time, and not just both sides of a single platter, like a PTD.

Suddenly you need much smaller manufacturing tolerances, because all of the heads have to be on track at once.

The super-small track spacing in current drives – tens of thousands of tracks per inch – means that tiny wobbles or misalignments between the platters and the heads will cause problems.

Only by outsourcing drive manufacturing to Protoss slaves could you overcome this problem economically.

All this highlights the awful pain we feel when reminded that hard drives are mechanical, magnetic devices. This technology goes back to the age of ENIAC and all those other old, dumb and unsexy machines. One day in the beautiful future we'll all be using a Zilliobyte of flash memory instead. It's a far sexier solution than the PC's equivalent to the LP.

Send your questions to I/O@atomicmpc.com.au or by post to: I/O Atomic PO Box 275 Beaconsfield NSW 2014

Polyscreenular gaming?

I recently bought a generic 32MB TNT2 M64 PCI video card for my second monitor. My primary monitor uses an ASUS V6800 DDR 64MB. The extended desktop in Windows 2000 and Windows XP is fine and useful, but I've seen people running games like Quake 3: Arena on two monitors. I also wanted to run Quake 3: Arena on both my monitors but couldn't. I edited the q3config.cfg file and got half of Quake on one screen, but a blank half window (had to be a 1600x600 window because it won't work full screen) on the other screen.

I have read that, by default, Windows does not allow OpenGL to run on two monitors simultaneously, or something like that. Is this true? Should I just forget about running multi-headed games?

I also found that when playing movie files in Windows Media Player or The Playa, the movie would only appear in the primary monitor. If I drag it to the second, there would still be sound, but no movie – just a black screen.

Jason Lee

Using just two monitors for 3D games isn't particularly desirable, because if you use the monitors for a wide-screen forward view, you end up with the break between them right in the middle of your field of vision. For useful wide view, you thus have to have an odd number of screens – three, or even five.

Trouble is, you probably can't actually make it happen, anyway.

For multi-screen 3D games, what you want is hardware accelerated 3D on every screen. Software rendered mode is uglier and much slower – since the CPU's doing all of the 3D graphics work – and many current games don't even have a software rendered mode.

With some combinations of NVIDIA chipset graphics cards – like, for instance, two GeForce2s of any flavour, or two TNTs of any flavour – the current NVIDIA drivers for Windows 2000 and XP let you use hardware 3D on all of your screens. But that's not useful for multi-screen gaming, because one 3D application can't display on more than one monitor.

You could probably run Quake 3 on one screen and Unreal Tournament on another, but the usefulness of this is questionable.

In Win98/Me, you may not be able to run OpenGL applications like Q3A at all, if you've got multiple monitors set up. OpenGL can only be used on the primary monitor, but the OS isn't smart enough to just turn off the other monitors when you run an OpenGL app, and will either fail to run the program, or just disable hardware acceleration and leave you with incredibly slow performance.

In Win2000/XP, provided the drivers for your video cards are up to scratch, extra monitors should be disabled automatically when you run a hardware accelerated game.

But that's still not multi-screen gaming.

Games that can run in windowed, software-rendered mode – like various flight simulators, for instance – will let you have windows on other monitors or stretch one window across several screens, depending on the type of game. Microsoft Flight Sim is particularly friendly for this and many hardcore sim fans use multiple monitor setups for this very purpose.

You may even be able to view hardware accelerated 3D on your primary monitor, and have windows on the others.

With only software rendering on the secondary monitors, though, they're only really good for things like dials and gauges and maps, unless you've got a seriously speedy PC.

Unreal Tournament works on multiple monitors in Windows, because it has a software rendered mode – but you'll need three or five screens, none of them will be hardware accelerated, and so you'll need to run a pretty low resolution on each screen if you want a decent frame rate. You can do multi-monitor Q3A, but only if you're running Linux.

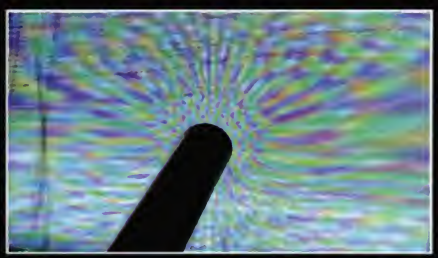
Most Windows DVD playback programs don't work on secondary monitors. The same goes for many video cards with TV tuners. There's nothing you can do about this.

DirectX 8 and Windows Media Player 6.4 or later, however, should let you play video files on secondary monitors. Not much else does.

The colours, man. . .

Could you please explain to me what degaussing is, what it does and how it affects/helps the monitor? I vaguely know what it does – something to do with the electro magnetic fields and how they stuff up the monitor's colours? I am just interested because I use this feature in the monitor, but was never quite sure what it does.

Chris



ABOVE: Repair magnetic damage AND create trippy colours!

A Cathode Ray Tube (CRT) monitor works by shooting three beams of electrons at the screen: one beam for red, one for blue, one for green. The inside of the front glass is coated with a pattern of red, green and blue phosphor dots, which light up the appropriate colour when electrons hit them.

To stop the beams from lighting up phosphors of the wrong colour, each beam comes from a different point at the back of the tube, and there's a perforated mask, or a grille of wires, behind the front glass of the monitor. The mask casts a shadow onto the glass, such that each beam only has line of sight to the right colour of phosphor.

The beams are steered by finely modulated magnetic fields. You don't need a lot of magnet power to steer them somewhere else, though. If there's something magnetic near the monitor – a loudspeaker with no magnetic shielding, for instance – a quite weak field will be enough to move the beams slightly off-course and cause noticeable blotchy colour shifts, and image distortion. If a field is strong enough to magnetise part of the monitor – like the shadow mask itself, for instance – then you can take the magnetic object away, and you'll still have a problem.

To degauss a magnetised object, you can heat it or hit it, but that's not entirely a practical thing to do with a monitor. Fortunately, you can also use a rapidly oscillating magnetic field that slowly decays away to nothing. That's what a monitor's own degauss coil does: you can see it create big colour and distortion effects when the degauss function first kicks in, but the effects then gradually decay away. The coil is just a few turns of wire around the body of the monitors, but it's enough to deal with many problems. If that's not enough, you can use a degaussing wand; that's mine scrambling the image in the picture.

Degaussing wands are more powerful oscillating field generators. Turn one on away from the monitor, move it close, make some magic passes, move it away, turn it off again. Lather, rinse, repeat.

Send your questions to I/O@atomicmpc.com.au or by post to: I/O Atomic PO Box 275 Beaconsfield NSW 2014

GEAR

ATOMIC GEAR

Atomic Toolkit
Fix anything! $29.95;
subscriber price: $27.95

Atomic Mug
Drink up $10.95;
subscriber price $8.95

Atomic T-shirt
IT activewear $19.95;
subscriber price $17.95

Atomic Illuminator
See the light $17.95;
subscriber price $15.95

Atomic Stockpile
Nuclear waste $16.95;
subscriber price $14.95

Atomic CD Stash Master
Stack 'em and pack 'em $14.95;
subscriber price $12.95

Complete yourself and comsume all the Atomicness you can handle. You could choose inferior, non-Atomic products or you could get your hands on the real thing. We have it on good authority that reality is good thing, so what have you got to lose?

Item	Quantity	Amount
Atomic Toolkit		$
Atomic Illuminator		$
Atomic CD Stash Master		$
Atomic Stockpile		$
Atomic Mug		$
Atomic T-shirt (version 2.0) M/L/XL		$
Total		**$**

All prices include GST

Subscriber number:
Email:
Surname: Mr/Mrs/Miss/Ms
First name:
Address:
Country: Postcode:
Phone: ( ) Fax: ( )

✔ Please tick method of payment

☐ Cheque/Money Order
Make payable to Atomic Magazine and post with this coupon to:
Atomic, PO Box 275, Beaconsfield NSW 2014, or
fax (credit card only) to (02) 9817 4955.

☐ Bankcard ☐ MasterCard ☐ Visa ☐ AMEX

Card Expiry Date: ☐☐ / ☐☐

Card No.: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Cardholder's Name:

Signature:

Date:

Build a PSX joypad adaptor for your PC

Craig Procter feels the force feedback joy.

Are you tired of playing your emulated games using the cursor keys or a joypad that is nothing like what you used to use on your console? Accept no substitutes: with a handful of dollars and a bit of cut 'n' soldering you can make a PSX force feedback joypad work on your PC. If you hide your PC under a towel, leaving only the control pad exposed, you can then trick friends into thinking you're running a PS2 on your monitor. Not that you'd ever want to.

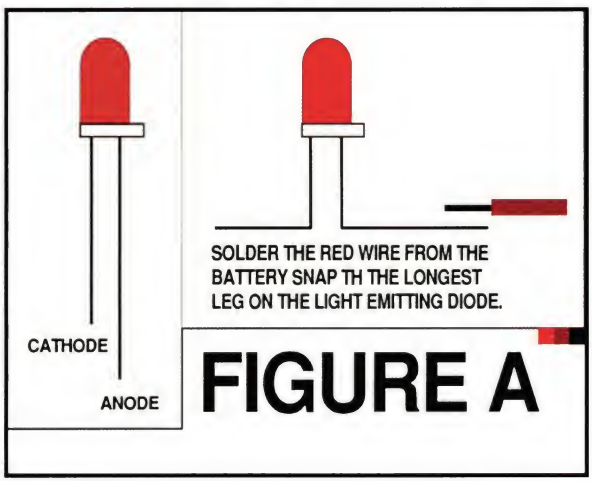
This project is easy to make, it's cheap and it's widely supported under DirectX and some emulators (eg: MAME and RAINE). So get into it.

The PSX extension cord was bought in Electronics Boutique while all other parts where bought at Dick Smith Electronics – but any electronics store should have the parts in stock.

You'll also need some solder, a soldering iron, wire cutters, a pen, paper and needle nosed pliers. A multimeter may come in handy as well.

The easy bit

If you don't have a multimeter (or even if you do) a simple continuity tester will prove to be an invaluable piece of equipment during the assembly of your modified PSX control pad. We'll use the LED as a light when testing our adaptor to see if the connections are OK before we plug it into our PC.



Bend the legs of the LED (as pictured) then solder the end of the RED wire of the battery snap to the longest leg of the LED.

Don't use too much solder as you may want to re-use the battery snap later. Touch the black wire which rusn from the battery snap to the short leg of the LED and, if you've hooked it up correctly, the LED will turn on. Don't hold it there too long as the wire will heat up and you'll drain the current from the battery very quickly.

The Parts

$0.06 ea.	5 x 1N914 diodes
$1.60	1 x 25 pin MALE DB25 connector
$1.12	1 x 9volt battery snap
$1.00	1 x 9volt battery
$0.27	1 x LED (any size, doesn't matter)
$14.95	1 x PSX extension cord
$2.68	1 x DB25 back shell (to hide all the wires in, not essential)

Cable sex education

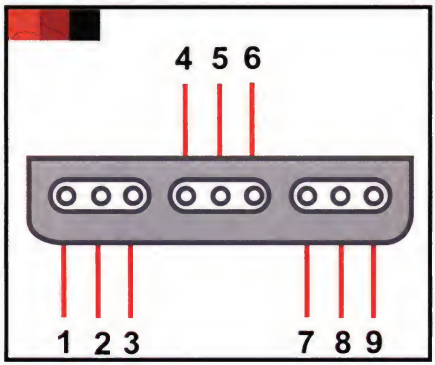
If you have a look at both ends of the PSX extension cable you'll notice they're different. One end has a series of little pokey out bits of wire while the other end has a series of little holes. The end with the wires is male (or a plug) while the end with the holes is female (or a socket). You can stop sniggering now.

Connect the PSX extension cable to your PSX joypad and use your wire cutters to remove the male connector from the extension cable, then remove around 2-3cm of the outside main plastic covering of the cable. There should be 7-9 wires inside the main cable and if you're lucky they'll all be different colours. Fan the wires out so they're easier to access and strip a couple of millimetres of plastic insulation off the end of each wire.

Now heat the wire very briefly with the soldering iron and apply solder so that it covers the end of the wire. This is called tinning, we do this to make it easier to solder the wires at a later date, and also to ensure a good electrical connection between the wire and whatever you're attaching it to. Don't hold the soldering iron on the wire too long as you'll melt the plastic insulation surrounding it and maybe the wire itself.

Who's on first, Watt's on second

Unplug the PSX joypad from the extension cable. Looking at the female connector end on, insert the LED into the left most socket on the female connector (pin 1) and touch the black wire from the battery snap onto each of the exposed wires at the end of the extension cable until the LED lights up. If your wires aren't different colours you're going to have to mark them with a texta or something so you can tell them apart. Write down which wire it is and then move the LED to the next socket and repeat the test until all 9 sockets on the female connector have had their corresponding wires identified.



Halfway there

Take a close look at the diodes and you should notice they have a black stripe around them at one end. Very simply a diode is like a one way valve - voltage will flow in the direction from the end without the stripe to the end with the stripe, but it cannot flow from the end with the stripe to the end without the stripe.

Trim the end without the stripe to around 5mm in length so that it will be easy to fit the diodes within the DB25 back shell.

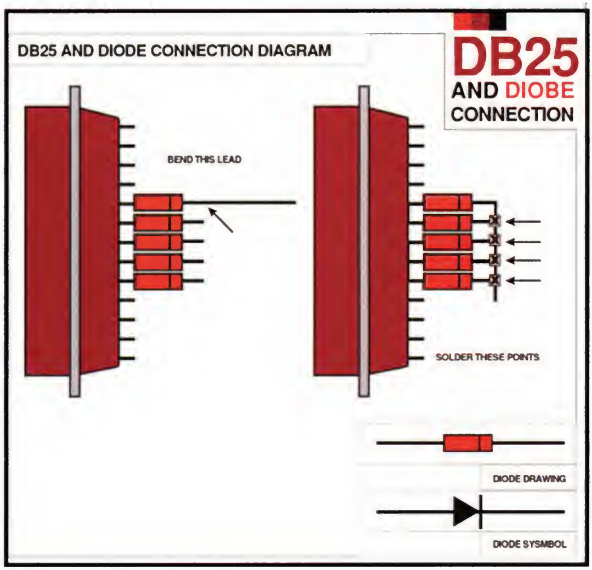
Have a look at the back of the DB25 pin male connector. Note that each pin is numbered but the numbering for these is in reverse order, from the left hand side to the right hand side.

Look at the circuit diagram. We need to solder the five diodes into place on the back of the DB25 connector. Insert the short end of the diodes into the back of pins 5 through 9 and solder them into place.

Try not to heat the diodes or the pins too much as the diodes may fail. Worse than that, the plastic may actually melt on the DB25 connector, leaving you with a spiffy new paper weight to give to your parents.

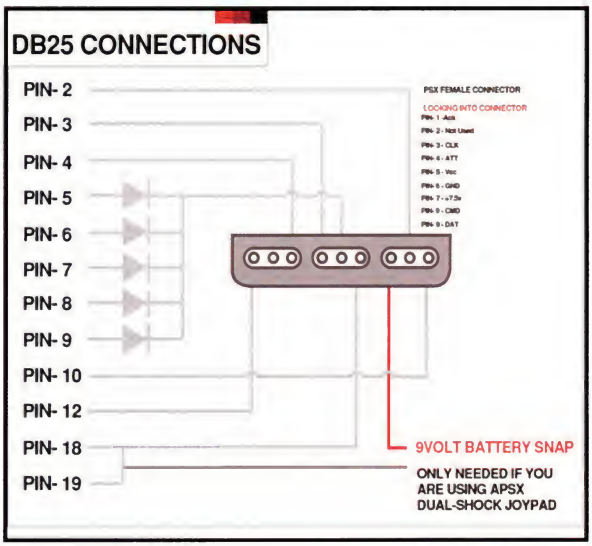
When everything has cooled down, you need to use your needle nose pliers to bend the long lead on the striped end of the diode on DB25 pin 5 to a right angle so that it touches the leads of the other diodes (see picture if this explanation confuses you).

Solder the other diode leads to this common connection and then trim away the excess wire. Use your pliers to make a little 'U' shape out of this excess wire with the legs of the 'U' approximately 5mm in length. Then you need to solder this onto pins 18 and 19 on the back of the DB25 connector.



Attaching the cable:

You will need to refer back to the list you made earlier of which socket on the PSX female connector corresponds to which wire, as well as refer to the circuit diagram below:

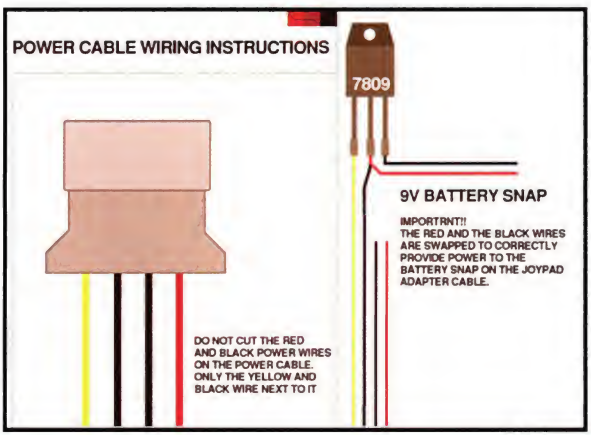


You can see that you need to connect the pin 1 wire on the extension cable to pin 12 on the DB25 connector, then pin 3 (pin 2 is not used) on the extension cable to pin 4 on the DB25 connector etc. Connect all the wires to the DB25 and take care not to use too much solder. You will notice that pin 5 of the extension cable connects to the common connection of the diodes and that pin 6 of the extension cable connects to the 'U' link between pins 18 and 19 of the DB25. When you have finished connecting all the wires you should do a quick continuity test between the female PSX connector and the DB25. Make sure that there isn't a short circuit between pins on the DB25 as it may damage your parallel port. If you have an older PSX joypad you're finished – proceed to the software installation instructions. If you have a PSX dual shock joypad you need a power supply for it. Heat the solder on the LED and battery snap wire and discard the LED. Solder the black wire from the battery snap to the 'U' connector on pins 18 and 19 of the DB25 connector and solder the red wire from the battery snap to the wire from pin 7 on the extension cable. You now have three options for power:

- you can use a 9volt battery, but it won't last for very long;
- you could wimp out and use an external 9volt 'wall wart' power adaptor; or
- you can be a true Atomican and make a voltage convertor that runs from your main PSU

How to do it Atomican style:

You'll need a L7809CV voltage regulator ($1.35 from Dick Smith), another 9volt battery snap and a 4 wire HDD 'Y' power splitter. Cut the yellow and the black wire next to it on one of the HDD power cables and tin the wire. If you look at the voltage regulator from the front (where the writing on it is) then solder the yellow wire to the left-most pin, solder the black wire to the middle pin. Then solder the red wire from the battery snap to the middle pin and lastly the black wire from the battery snap to the right-most pin on the voltage regulator.



IMPORTANT: Note that we are wiring this battery snap up in reverse – so that the connectors at the end match those of a battery when connected to the battery snap that is on our joypad adaptor.

NOTE: The battery snap for this power adaptor needs to be accessible outside your case (specifically next to your parallel port). So you may need to run the wires from the battery snap through a hole in the back of your case (drill one if you need to) before you solder them to the HDD 'Y' power cable.

If you have a multimeter, I'd suggest using it to test the voltage on the external battery snap just in case it is not 9 volts DC. If you don't test this, don't cry if something begins to emit blue smoke.

Installing the Software

You will need to download the Direct Pad Pro software from www.arcadecontrols.com/files/Drivers/dpadpr50.zip or www.aldostools.com

(Aldo's Tools site also has modified drivers for NT and XP).

Unfortunately, this software is no longer supported or updated by its author Earle F. Philhower III, though the source is included and is released as freeware.

Unpack the dpadpro5.zip archive then go to control panel/Gaming Options and click the Add button. Click the Add Other button. Click the Have Disk button and then browse to the directory where you unpacked the dpadpro5.zip archive. Select the direcpadpro.inf file and click OK, OK, OK and then Finish.

In your Add Game Controller list there will now be two new entries: Directpad Pro Controller and Directpad Pro Force Feedback Controller. Select the Directpad Pro Controller if you aren't using a force feedback joypad.

Click the Properties button and then select the Controller Type in the drop down box (bottom left). Select PSX Digital if you aren't using force feedback. You may also need to select the Parallel Port in the drop down box in the lower right hand section of the screen if your parallel port isn't at the default 0x378 memory address. Press the buttons on your PSX controller and you should see the various boxes in the panel turn black.

The dpadpro5.zip archive also has circuit diagrams for making joystick adaptors for the Atari, NES, SNES and Megadrive consoles – they're perfect for playing emulated games and they're even easier to make than the PSX joypad adaptor.

Winny the pooh

Every 5.7 seconds a Boeing 737 takes off, somewhere in the world. Every four weeks, a small handful of people win free stuff in Atomic. Coincidence or not? Did you know that the World's Tallest Building isn't a building at all – but A FISH! When the president of Boeing was asked what would happen if the prototype 747 crashed on takeoff, he said 'Can we talk about something cheerful, like nuclear war?'. Pandas are black and white so they can camouflage themselves in the bamboo foliage.

Put the name of the comp on the envelope, or as the email header. Include your address and contact details and sacrifice a baby lamb to the sun god Ra.

Waitec Hip Hop MP3 CD

Music, along with lurve, makes the world go around. Like the Candy Man, who sprinkles it with love. What exactly he's sprinkling, we're not sure. What we are sure about is that the Waitec Hip Hop MP3 CD player goes around, with music, like a record, baby. We're giving one away with a pack of 5 x 8cm CDs. That's $325 worth of musical lurve. Bloody fabulous.

Q: Name the bandmembers of Grandmaster Flash and the Furious Five.

Autographed Tony Hawk 3

If Tony Hawk, like, had kids and called them, like 'Tony Hawk the 2nd', or, like 'Tony Hawk the 3rd', then Activision could probably, like, sue him, or something. Cos, like, Activision has Tony Hawk 3. Activision OWNS him. Tony Hawk 3 owns you too. It's so fully sick it's not funny.

Atomic loves you as well, so with the combined love of Tony Hawk, Activision and Atomic we've created this neato comp.

We've got two really super prize packs – each has a copy of Tony Hawk 3 for PC plus a copy of the CD soundtrack – autographed by Big Tony himself! Unbelievable.

Q: What sort of company was K*Grind?

Gigabyte RADEON 7500

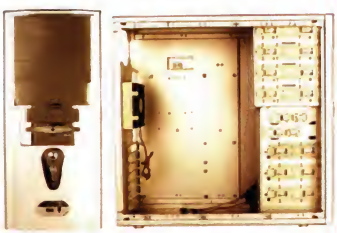
Does your 'Hot Box' have it all? Does it have Perspex? Neon? Carry handles? Well maybe it does! But. . . does it have. . . a VIDEO CARD? Huh, punk? We'll tell it to you straight, here and now, that without a VIDEO CARD you're not playing with the grown ups.

The Gigabyte RADEON 7500 is fast and visually pleasing, which is important to be, if you're a video card.

Q: What was the name of the Soviet rocket destined for the USSR's failed moon landing?

Dilithium AL3

Until wood can be effectively manufactured as a PC case material, Aluminium will just have to do. The AL3 from Dilithium (www.dilithium.com.au) is one such, non-wood, case. It's attractive, shiny, lightweight and thermoconductiveny. You can put an Atomic sticker on it if you win.



So lose the steel beige and enter the shiny Aluminium age, after all, as we say at Atomic: 'Why wait for wood?'.

Q: Which player pioneered the Aluminium cricket bat?

Email entries to win@atomicmpc.com.au or post them to: Atomic, Competition Name, PO Box 275, Beaconsfield NSW 2014. The closing date for entries is 17 April 2002. Winners will be announced in Atomic 17.

Atomic 13 winners: NaturalPoint TrackIR: Q. What head-tracking device is used for targeting on AH-64 apache attack helicopters? A. IHADSS (Integrated Helmet And Display Sight System). J.Osmond, email: Red Ant Shattered Galaxy. Q. What is the nearest galaxy to ours, and how many light years away is it? A. The Andromeda Galaxy, which is 2.2 million light years away. A. Roberts, Shortland NSW; J. Chong, Rowville VIC; S. Baly, Wynyard TAS; I. Cunning, email; P. Tayne, Yagoona Heights NSW; S. Cornwell, Buxton; B. Nunez, Rockdale NSW. Quake 3: Arena Linux autographed. Q. On what newsgroup was Linux first announced? A. comp.os.minix. T. Starkey, Bowen Nth QLD; Luke, email; J. White, Levin NZ; B. Jarcevic, St Kilda VIC; W. Louey, email; R. Jardine, email; N. Nguyen, email; R. Jockel, Toorak VIC; S. Medici, Timaru NZ; A. Kerr, Kooringal NSW. Return to Castle Wolfenstein: Q. What was Basil Fawlty's one rule when dealing with German guests? A. Don't mention the war! D. Heath, Grange QLD; Links, email; M. Richardson, Hobart TAS.

The page o' reader wisdom

Please, tell us. Each month you get the chance to smear a piece of your mind on the page. If you smear well enough then you could win a funky prize. This month our letter of the month and post of the month both win a sexy Volcano 7 HSF from Aus PC Market (www.auspcmarket.com.au)

POTM: Burn baby burn

There is a warm glow that comes from helping your fellow human beings. After whipping up a home made thermometer from some mercury, a drinking straw and some chewing gum we found under a chair, we have located a motherlode of warmth emanating from the tech support sections of the Atomic forums. As we honed in we found that Daggoth had been responsible for one of the hottest of hotspots with this explanation of buffer underrun protection. Keep on spreading the glow at:
www.atomicmpc.com.au/forum.asp?cat=te&top=31921

Most burn-proofing methods nowadays actually shut off the burning laser when there is no data to burn, and the device continues seeking to that position until there is more data, at which point it starts the laser again.

The reason your burner needed protection 83 times is because you were trying to burn too fast. The burner wasn't given enough time to buffer enough data for continuous burning before the IDE bus had to cycle back to the CD-ROM drive for more data. Burn at 16 speed next time, and you'll notice a lot less protection will be required.

Also of note is that since buffer underrun protection has become common, most CD burners nowadays have smaller actual buffers. My 241040 burner only has a 2MB buffer when pre-burn proofing buffers were up to 8MB. At 24x I believe the burner writes at about 4800KB/sec, which means that the buffer is exhausted in half a second. HDD->CD burns can support that speed, as the HDD has a much higher transfer speed than the burner. CD->CD burns suffer at such speeds because even though the reader is faster than the writer, the overheads involved in transferring the data between the two often means the buffer is empty before more data comes, and thus the protection kicks in. I hope that's been informative for you.
Daggoth

LOTM: 1+1= w00t

I am writing to ask about the origins of the word w00t.

My friend is a maths teacher and has got his whole year seven class saying it. We are now a bit concerned that it might mean something obscene. So far, we only understand w00t to be an expression of joy. Is this correct?
JasonP

w00t is indeed an expression of joy, which would only be considered obscene by those people who hate Everquest, or those Everquest players who are sick of hearing it.

As far as we can determine, the term w00t has its origins in the online world of Everquest, in which it is a term derived from 'wondrous' and 'loot'. Hence, if someone was saying w00t it meant that they had just found some fine booty.

The term was so widely used in early days of Everquest that some Guilds (including a certain Guild to which our Evil Admin belongs) banned their members from using it.

Maybe use of this word could be translated into a positive experience for the year seven maths students you speak of. Would it not be more relevant to grade tests using a more 'with it' and 'hip' (in a geekish sort of way) scheme in which A becomes w00t, A+ becomes w00t! and A++ becomes w00t!!
Think about it.

'As this continued on for a few months, I started to recognise the regulars, the spammers and the rare troublemakers. Best of all I organised and attended my first Atomic m33t'

Joystick shmoistick

I am a Flight Sim fan – have been for years – but when I decided to change to Windows XP I bought Flight Sim 2002 as well. Imagine my surprise to find I cannot use my Microsoft SideWinder Force Feedback Pro joystick. Only the new Microsoft SideWinder Force Feedback 2 is supported, so I had to buy a new joystick. I have filed a complaint against Microsoft with the Department of Fair Trading Tribunal for the cost of the new joystick and I am currently waiting for a hearing date to be set. In the Windows XP Hardware Compatibility List the two joysticks are shown three times. Firstly, one is shown as meeting the requirements of the Logo Program, while one is not XP compatible. Secondly, both are shown as XP incompatible. Thirdly they are both shown as XP compatible. Confusing eh!

Ray Richards.

Community values

I thought I would have a go at summing up how the forums look through my eyes.

It was the end of the day and I had just finished my TAFE class. I thought it would be a good idea to go hire some videos or a game. However, it turned out the store had nothing that tickled my fancy so I went to the newsagent instead.

I hadn't bought a computer magazine for a while so I decided to have a browse in the tech section and see if anything caught my eye. I saw a magazine with a green and bronze cover that mentioned articles about an Athlon 2.4GHz MP processor and GeForce3s. The magazine was called Atomic, and it was Australian, so I bought it.

When I completed reading the magazine I decided to browse the Atomic Web site mentioned in the magazine. I had a quick look around, entered the forums and after reading a few posts I decided I would have a go and post my first post.

As this continued on for a few months, I started to recognize the regulars, the spammers and the rare troublemakers. Best of all I organised and attended my first Atomic m33t which was a movie outing to see Hackers and Wargames at the Astor Theatre. Now I will admit I was quite nervous about meeting Atomicans in real life, but it turned out to be a great night and I got to meet some great people.

We have something special here folks. The forums are full of some of the kindest, loyalist, smartest, friendliest people that you could ever come across.

That is the way of atOmic.

wOOt, wOOt, and double wOOt.

trev99

PDA me baby!

First up, I'd like to say congratulations and thanks for a fantastic magazine. Australia has lacked a good hardware review magazine for some time, and Atomic certainly fills the niche quite comfortably. It's gone from a time when I was one of the few buyers of Atomic at my local newsagency, to now where I have to make sure to get in early so I can actually get one! I had no idea there were so many Atomicans in South Melbourne.

The main purpose of this email is to ask a question or two about the great PDA related content in Atomic over recent months, which I'm very glad to see, being a PDA technician myself. Being in a field just coming into the popular computing scene, I see plenty of mistake riddled articles in other publications that are not only annoying, but create issues for us techs when customers come in and say, 'Well so-and-so said this,' and we have to tell them that it's totally wrong. Some people just won't believe us – even after speaking to the manufacturers themselves.

Best of luck in future issues.

Leigh Stillard

Getting harder

I just wanted to pass on my congratulations on such a great magazine!

I have 'stumbled' across Atomic via your relationship with Take 2 (we publish Max Payne, Serious Sam, GTA3 etc). I only joined the company a few months ago and since I started looking through the Atomic mags I have been taking them home for a good read, and I love them!

Being an ex-tech, I worked my way through the old electronic mags then the wide range PC mags. Other PC mags have become far too commercial, broad and consumer focused. Atomic is a breath of fresh air for the home PC tinkerer and tweaker (which I love doing).

While I'm not 'hardcore' I do like pushing the envelope with what I have for both hardware & software (half the battle is getting everything to work stable under a Microsoft world – ahhhh!). Although I don't get into the custom boxes, I must say some of your page 18 samples give me incentive to consider it.

My compliments to the Atomic team!

Ron

Rubber bands and you

Hi, I am just writing (typing) to let all the other Atomicans out there know that rubber bands are an ingenious invention!

After browsing the local Dick Smith Electronics store I found four heatsinks that would be perfect for my video card, because my video card, a TNT2 m64, is a stinky piece of equipment and it did not have any support for heatsinks!

As heatsinks cost a dollar each, I wasn't ready to pay $15 for a lil' tube of thermal adhesive! So I tried to think of a solution. And then it HIT me: the humble and overwhelmingly simple rubber bands would solve my problem! By putting them through the fins of the heatsink and stretching them around the graphic card's PCB, it easily and effectively attached my heatsink with the little bit of thermal paste I already had lying around!

thimothy

Just Cooler®

Worldwide Patents

Notebook cooling pad

NB-600
Notebook Cooling Pad
Dissipates hot air from the bottom layer of notebooks.

Monitor Cooler

MC-100
Monitor Cooler
Maintains air circulation from monitor, serves as a thermal radiation preventer & dioxin odor terminator.

3.5"/5.25" Bay System Cooler

ST-900
Mainboard Cooler
Forces air onto drive bay area to increase system reliability.

TT-900
Reversible Twin-Turbo Cooler
Keeps CD-RW drive cool, essential for reliable recording.

Security system

SS-100
Security System
Power source & Reset locking by PIN. Built-in timer. Ideal for server protection or timed usage control.

Remote Controller

RC-168
JUST COOLER
PC REMOTE CONTROLLER
NEW

5.25" Bay HDD Cooler

HD-100
2-Fan HDD Cooler

HD-200
3-Fan HDD Cooler

HD-120
2cm thick fan

NEW

FC-610S
RAINBLOWER SYSTEM COOLER
68X73X30mm
Airflow:18CFM

NEW

FC-810S
RAINBLOWER SYSTEM COOLER
88X93X30mm
Airflow:32CFM

NEW

FC-1200S
RAINBLOWER SYSTEM COOLER
130X135X30mm
Airflow:90CFM

HD-600
Anti-Dust Cover Cooler
A specially designed housing base to prevent system overheating and accumulated dust.

FA-100
Fan Alarm System
A buzzer & pilot indicators with built in microprocessor. Detects up to 4 coolers' failure/malfunction.

System Cooler

Slim Case Design

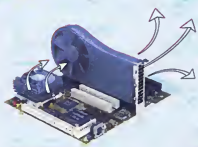
FC-500PS
- FC-500 with installation adapter.
- Fits printer port slot.

FC-100
- Dimension : 120 x 90x 27mm
- Airflow : 32 CFM
- Voltage : DC 12V
- System cooler for Pentium II & A.G.P. Card

FC-200
- Dimension : 108x 90 x 27mm
- Airflow : 32 CFM
- Voltage : DC 12V
- System cooler for Server, Raid, industrial PC (on SCSI port)

NEW

FC-910D
RAINBLOWER DUAL FAN SYSTEM COOLER 98X195X30mm
Airflow: 80CFM



FC-900L
Central System Cooler
Draws heat out from mainboard & PC case.

DR-100
Dehumidifier
A specially designed cooling fan which removes moisture from PC mainboards

CPU Cooler / Second Fan

P-925B
For Intel Coppermine FC-PGA Socket up to 1GHz

P-22A (Dual Fans)
For ATHLON (AMD K7) & Pentium II-compatible

P-600 (6cm Fan)
For Socket 370 600MHz and up

P-500
For Socket 7, Socket 370 500 Mhz and up

CS-100
Chipset cooler for AGP cards, mainboards. Adhesive type

CH-420
AGP card chipset cooler (ball bearing) Clip type

SF-600
(60x60x25mm)

SF-800/SF-800B (Ball bearing)
(80x80x25mm)

SF-801/SF-801B (3 wire)
(80x80x25mm)

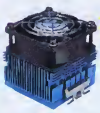
SF-900
(92x92x25mm)

P-22SII (Dual Fans)
For SECC II & Pentium III

P-22C (Dual Fans)
For Celeron

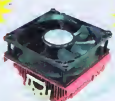
NEW

C1300
PURE COPPER HEAT SINK CPU COOLER FOR AMD/INTEL P3 UP TO 1.3GHz BALL BEARING



NEW

P-6000B
(BALL BEARING)
CPU COOLER (6X6CM) FOR AMD K7 1.3 Ghz OR INTEL 1.13GHz.



NEW

P-8000B
(BALL BEARING)
SUPREME (8X8CM)
CPU COOLER FOR AMD K7
UP TO 1.5GHz OR INTEL 1.13GHz

Anyware™ COMPUTER ACCESSORIES
Australian Importers & Wholesalers www.anyware.com.au

SYDNEY
No 3, 14 Tennyson Road
Gladesville NSW 2111
TEL: 02-9879 5788
FAX: 02-9879 5388

MELBOURNE
42 Henderson Road
Rowville VIC 3178
(Off Laser Drive)
TEL: 03-9763 8200
FAX: 03-9763 8400

PERTH
Unit 2, 9 Leeway Court
Osborne Park WA 6017
TEL: 08-9242 8588
FAX: 08-9242 8688

Get your XBOX bundle now!

The Basic

one Xbox console
one genuine controller
one Xbox game of your choice

for $769.90*

The Gamer

one Xbox console
two genuine controllers
one genuine memory card
one Xbox game of your choice

for $899.80*

The Lot

one Xbox console
two genuine controllers
one genuine memory card
one genuine DVD kit
four Xbox games of your choice

for $1,209.80*

Choose from our large selection of games

and many more ...

Order online:
www.gamesmarket.com.au
xbox@gamesmarket.com.au
Phone. (02) 9954 0013

GAMES MARKET .com.au

or visit our store:
Shop 1, 54 Miller St
North Sydney, NSW 2060
Phone. (02) 9954 0013

*$20 surcharge per bundle applies for delivery within Australia.

Proudly affiliated with:

spotit.com.au

www.globalethnic.com.au
asian groceries

dLife

your digital lifestyle store

accessories

Crystal Optical Wheel Mouse (no buttons, swing and click!)	$ 49
> Available in Graphite, Silver, Pearl White & Pearl Blue	
Sitecom Firewire + USB Combo Powered Hub	$125
Sitecom USB 2.0 PCI Card - 4 Port	$ 69
Sitecom USB 2.0 PCI Card - 2 Port (Card Bus)	$145
Sitecom USB 2.0 Powered Hub	$ 89
Sitecom Wireless Network PC Card (128Bit WEP)	$219
Sitecom Wireless Access Point (128Bit WEP)	$699

LaCie 40x24x10 CD-RW Drive (USB 2.0 & FireWire)	$539
LaCie Pocket 24x8x4 CD-RW Drive (USB 2.0 & FireWire)	$639
LaCie 40GB 7200rpm HDD (FireWire External)	$459
LaCie Pocket 20GB HDD (USB2.0 & FireWire)	$549

pda

Hewlett-Packard Jornada HP565 (32MB)	$1145
Hewlett-Packard Jornada HP568 (64MB)	$1299
Compaq iPaq 3850 (64MB)	$1299
Compaq iPaq 3870 (64MB, Bluetooth)	$1399
Toshiba PocketPC e570 (64MB)	$1245

graphics card

3D Power GeForce4 MX-440 (64MB, TV Out)	$279
3D Power Morpheus Ti 500 GeForce3 (64MB, 3.6ns, TV/DVI, Game)	$851
3D Power GeForce2 MX-200 (32MB)	$159
3D Power GeForce2 MX-400 Pro (64MB, 4.8ns RAM, TV Out)	$295

speaker system

Klipsch ProMedia 4.1	$699
> THX certified, 5 piece speaker system	
Klipsch ProMedia 2.1 (3 piece, with 200W of power)	$399
Altec Lansing ADA890 (THX Certified, Dolby Digital, 5 piece)	$569
Altec Lansing 641 (5 piece, 400W, 4.1 Digital speakers)	$649
Altec Lansing 621 (3 piece, 200W, 2.1 Digital speakers)	$315

Prices quoted are inclusive of GST and is subject to stock availability.
Limited stock, valid only while stock last

store address: shop 6, 385 pacific highway
crows nest nsw 2065
phone: (02) 9966 1077
fax: (02) 9929 3533
email: sales@dlife.com.au
website: http://www.dlife.com.au

pc games

Ghost Recon $81.95

V8 Challenge $63.95

Sid Meier's Sim Golf $63.95

Medal of Honor $89.95

Empire Earth	$89
The Sims + Cordless Mouse	$59
Settlers 4	$47
Fallout Tactics	$47
The Longest Journey	$81
IL2 Sturmovik	$64
Scrabble	$49
Baldurs Gate - Original Saga	$29

Call for our latest games specials.

Have you done your "CASE" study?

We are talking about Aluminium Cases!

You may have the latest and fastest CPU and VGA cards. Do you have the best case to house all the greatest components? Aluminium cases dissipate heat 3 times faster than the traditional steel cases and when Lian Li builds it, your PC experience is guaranteed luxurious. Here are some comments:

apc *Australian Personal Computer*

"Lian Li cases are legendary among PC enthusiasts and case-modders, and are generally considered to be the Rolls Royce of aftermarket PC cases. Not only because they are comparatively expensive, but because their features and attention to detail warrant the price."

PC PowerPlay

"A stunner. All aluminium and built to withstand a direct nuclear strike in the megaton range. As we have mentioned more than once, we even dropped this case down a flight of concrete steps and it barely flinched. Ten bays keep everything snug, three extra fans keep it cool, and slide-off covers and a motherboard tray mean it's ready for upgrade action any time".

See detail reviews (search "lian Li") at

www.dansdata.com
www.overclockers.com.au
www.gamingin3d.com

All cases come without power supplies

Aluminium Tower Cases

PC-60USB
Silver full aluminium anodised
$390 RRP

PC-65USB
With transparent side panel
$475 RRP

PC-12B
Powder coated external with full aluminium inside
$320 RRP

Common features
- Sliding tray for motherboard
- 2 front ball bearing fans with filter
- 1 rear ball bearing fan
- Selectable fan speed control
- Thumbscrew
- 490x210x450mm
  12 total bay 4x 5.25", 3x3.5", 5x3.5 Hidden

PC-70
Silver full aluminium anodised $539 RRP

PC-71
Black full aluminium anodised $559 RRP

- 2 front ball bearing fans with filter
- 2 rear ball bearing fan
- Selectable fan speed control
- Thumbscrew
- 210X595X588mm. Suitable for dual CPU M/B.
- 15 total bay

PC-5 Economic
Beige Colour powder coated
$199 RRP

PC-6 Economic
Silver colour powder coated
$199 RRP

- 2 front fans with filter
- 1 rear fan
- Selectable fan speed control
- Thumbscrew
- 490x210x450mm
- 12 total bay 4x 5.25", 3x3.5", 5x3.5 Hidden

Aluminium Server Cases

PC-72SCA
Silver full aluminium anodised
- SCA-2 hot swap bays supports SCSI Ultra160
- SCA-2 backplane module
- 2x16cm ball bearing fans
- Selectable fan speed control
- Thumbscrew
- 589x209x574mm
- 13 total bays

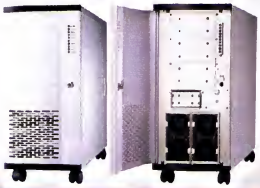
$790 RRP

PC-626
Silver full aluminium anodised
270x665x498mm
- 14 total device bays
  4x5.25,3x3.5, 8x3.5 hidden for HDD
- 4 x 12cm two ball-bearing
  Suitable for dual CPU M/B
- On SCA version: SCA-2 Hot Swap bays, Support Ultra 160, SCA-2 backplane module

$1190 RRP, SCA $1390 RRP

PC-76
Silver full aluminium anodised
- 20 total bays 6x5.25,2x3.5, 12x3.5 hidden
- 6 ball-bearing cooling fan
- 265x559x630mm
- Suitable for dual CPU M/B

$990 RRP



PC-78
Silver full aluminium anodised
- 20 total device bays
  6x5.25,2x3.5,12x3.5 hidden for HDD
- 4x 8cm two ball-bearing fan
  2x 12cm two ball-bearing fan
- Suitable for dual CPU M/B
  (Max size: 12x13)

$1650 RRP

Case accessories

PANEL-65
Silver colour aluminium
Transparent side panel to suit PC-60USB $85 RRP

PANEL-75
Silver colour aluminium
Transparent side panel to suit PC-70USB $115 RRP

FE-525
Silver Aluminium Front Easy
Access all PC ports at the front of the PC $90 RRP

T-4 /T-4B
Dual thermometer
Silver /BlackMonitor CPU/MB/HDD temp
$59 RRP

MF-30HDD
Expansion mounting kit
Add 3 more HDD space to PC cases
$19 RRP

F-7 /C-2 /C-4/C-6
Aluminium bezels for FDD and popular CDROMs
CDROM/DVD models: Sony-CDU-5211, Pioneer DVD-116, TEAC-CD-540E
From $9.90 RRP

EX-12S
SCA-2 Module
SCA-2 Ultra-160
Hot swap module.
Takes 2x 5.25" bay space
$270 RRP

www.scorptec.com.au

scorption TECHNOLOGY

ONE STOP SHOP FOR YOUR COMPUTER NEEDS

WE DELIVER AUSTRALIA WIDE INCLUDING TASMANIA, CASH/CREDIT CARD/COD/DIRECT DEPOSIT PAYMENT ACCEPTED

Monitors

15" Colortoc LM15D..... $799
15" AOC LCD TFT.....$730
15" Somtron 55E.....$235
15" Philips 105s.....$265
17" AOC 7VLR 27 .....$290
17" AOC KLR Flatscreen .. $375
17" Hitochi Cm621 Flat.....$420
17" LG Flatron 775FT.....$395
17" LG Flotron 795FT.....$465
17" Somsung 753DXF.....$440
19" AOC 9GLR .25 dpi $490
19" AOC 9KLR 0.25 FLAT....$599
19" Hitochi Cm721 Flot.....$730
19" Hyundai Image Quest$550
19" Philips 109P Flat $895
17" Sony E230 Flat.....$585
19" Sony FD G420 Flat....$1125
19" Viewmoster 0.26.....$480
19" Viewmoster FLAT.....$590
21" Sony G520 Flot.....$1995
21" Philips 201P.....$1980
15"/17"" Screen Filter....$20/$30
19"/21"" Screen Filter.....$45
RGB BNC Monitor coble $30

PRINTERS

Conon BJC1000.....$99
Epson C20UX/C40UX$115/$155
Epson Stylus C60 .....$240
Epson C70/C80.....$380/$540
Epson Photo 810/895 $340$640
HP 640C (Special).....$120
Xerox 8ppm Loser..SPECIAL$399
Xerox 12ppm Loser.1210...$720
Xerox P1210 Tonet.....$270

SCANNER

Acer 3300/4300.....$99/$170
Conon FB670U/D660U$175/275
HP Sconjet 2200/4400$165/260
Epson 1250/Photo....$220/$265
Epson 1650/SU Photo$360/$435

SOUNDCARD

Creative Vibra 128 .....**$35**
Creative SB Live Value.....**$70**
Creative SB Live DE 5.1 SE $95
Creative Audigy DE.....$195
Creative Audigy Plotinum...$395
Creative AudigyPlotinumEX**$465**
Game Sound Muse XL.....$60
Game Surround Fortisimo II$110
Game Theater XP..... **$240**
Philips Seismic Edge 5.1...$170
Philips Accoustic Edge5.1$260

SPEAKERS

Altec Lansing AVS500.....$145
Creative PC Works.....$70
Creative SW320.....$85
Creative FPS 1600.....$160
Creative Inspire 5300.....$290
Creative Inspire 5300+ 5.1$340
Creative DTT 3500.....$695
Philips 80w RMS 5Flat spkr...$330
Yomoho YST-M201.....$120
Creative Surround stands ..$70

CDROM / DVD

Asus/Liteon 52x CDROM.....$60
LG 52x CDROM.....$64
Sony 52x CDROM.....$70
Liteon 16x48 DVD Retoil.....$130
Pioneer 16x DVD Tray ATA66$125
Pioneer 16x DVD Slot ATA66$145
Pioneer 16X DVD Slot Retoil $185
Samsung 16x48 DVDROM...$115
Sony 16x40 DVDROM.....$125
Power DVD v3.0 Software ..$15

CD/DVD WRITER

Acer 24x10x40 OEM.....$200
Acer 24x10x40 Retoil.....$220
Cyberdrive 32x12x48 Retoil $220
LG 24x10x40 OEM.....$225
Liteon 24x10x40 + Nero5...$220
Plextor 24x10x40.....$450
Ricoh 7240 24x10x40.....$240
Sony 24x10x40 Memoryslot$385
Pioneer DVR-A03 DVDRW .$1250

CPU

VIA C3 800 (133mhz) CPU...$125
Celeron 1000/1.2ghz.$175/$225
P3-Tuolotin 1.26 512kb.....$540
Duron 900/1000.....$115/$135
Duron 1100/1200.....$160/$175
Athlon XP 1600/1700 $265/ $285
Athlon XP 1800/1900 $345/$475
Athlon XP 2000+.....$580
Intel P4 1.6/1.7ghz....$320/$380
Intel P4 1.8/1.9ghz....$460/$560
Intel P4 1.6A/1.8A .....$350/$480
Intel P4 2.0A.....$895

CPU FANS

Coolermoster HHC001 $80
Globolwin WBK38/68.....$45/$40
Volcono II Thermoitoke.....$30
Volcono 6CU Thermoitoke....$40
Volcono 6CU+ Thermoitoke..$45
Volcono 7 Thermoitoke.....$55
Thermal Toke Super Orb.....$49
Dragon Orb III 7000rpm.....$55

Motherboard

ABIT **KR7A/KR7ARaid....$315/$365**
ABIT ST6/ST6R.....$195/235
Asus P4B SDRAM P4 478.....$310
Asus P4B266 P4 478 DDR.....$395
Asus P4T-E 478 RDRAM.....$400
Asus P4S333 P4 DDR.....$300
ASUS A7V266-E DDR $295
ASUS A7V266-E DDR Audio .$320
ASUS A7V266-E DDR RAID.....$365
Asus TUSL2-C.....$220
Asus TUSI-M All In one.....$160
ECS K7S5A DDR/SDR Socket$140
Epox 8KTA-L/8K7A+.....$165/$250
Epox 8KHA/**8KHA+**.....$200/**$210**
Epox 4SDA/RAID SIS.....$265/$295
Epox 4BDA DDR/Raid...$295/$325
Gigobyte 8IDX 478 SDR.....$265
MSI **K7266A/Raid**..... **$250/$295**
MSI Nforce 420 Pro.....$300
Soltek 75 DRV2/DRV4....$195/$215
VIA P4X-266 DDR P4 .....$260
VIA P4X-266 DDR P4 RAID $300

Hard disk

IBM 60GXP 7200RPM 20gb.....$185
IBM 60GXP 7200RPM 40gb.....$235
IBM 60GXP 7200RPM 60gb.....$275
IBM 10gb/20gb notebook $225/$330
Maxtor 40g 5400/7200-133$175/$200
Maxtor 60/80g 72K A133....$260/$360
Seagote 20/40 7200 ATA IV $180/199
Seagate 60/80 7200 ATA IV .$249/349
WD 40/60gb 7200rpm .....$200/$260
WD 80/100gb 7200rpm ....$360/$540
WD 100gb SE 7200rpm 8mb.....$580

Graphic card

Asus 64mb Gf2 MX400 TV OUT...$185
Asus V7700 Gf2 Ti 64mb Deluxe$395
Asus 64mb Deluxe Gf3 Ti200DLX$555
Asus 64mb Deluxe Gf3 Ti500DLX$875
Ati Rodeon 7200 64mb.....$260
Hercules Gf2 Ti 64mb TV.....$330
Hercules Gf3 Ti200 64mb Tv.....$460
Hercules Gf3 Ti500 64mb TV $740
Leadtek Gf2 MX-400 TV Out.....$195
Leadtek Gf2 Ti 64mb TV Out.....$240
Leadtek Gf3 Ti-200 64mb TV.....$390
Leadtek Gf3 Ti-200 128mb TV $475
Matrox G550 32mb Duol OEM...$295
MSI Gf2 MX-400 64mb TV out $165
MSI Geforce2 Ti Video In/Out 64$290
MSI Geforce3 Ti200 ViVO64mb $480
MSI Geforce3 Ti500 ViVO64mb $750
Galnward Gf2 MX-200 32mb.....$110
Goinward Gf2 MX-400 64mb TV.$165
SIS 32MB AGP ViDEO CARD..... $55
Geforce2 MX-400 64mb $140

Cases & Power Supply

Aopen H600A(300w) Miditower $185
Aopen HQ45P4(250w)Miditower $120
Aopen HQ45P4 PRO Miditower $130
Aopen HQ08P4(300w) Fulltower $195
Aopen HQ95P4(250w) Desktop $120
Aopen Gf45 P4(250w)Miditower $110
Aopen KF45 250w/P4..... $ 75/$85
ATX Full Tower case 300w PSU.... $110
InWin Q500N Full Tower 300w.....$185
Lion-Li PC10 /Pc12 Aluminium....$285
Lion-Li PC60S Aluminium (USB)...$360
Lian Pc65 Alumunium +window$425
Top Power 352w/400w ATX...$80/125
Task 3003 250/300w P4.....$99/$115

Networking

Aopen 325 PCI 10/100 Cord.....$30
Intel 8460C PCI 10/100.....$80
Netgear RT311 Router.....$299
Netgear RP114 Router+switch...$380
Surecom ADSL/Coble Router.....$265
Surecom 5/8 port 10mb HUB$50/$65
Surecom 5port10/100 Switch .. $120
Surecom 8port10/100 Switch .. $150
Surecom 4 port USB HUB..... $55
Surecom 10/100 USB Adaptor ...$75

Modem

Aopen 56k v.90 Ext.....$ 85
Aopen 56K USB Ext modem $70
Dynalink 56k external.....$90
Mitsubishi Internal 56k OEM.....$45
Netcomm Internal PCI 56k $50
Progmatic Internal/External $40/$80
3COM USRobotics /MSG $160/$175

Controller

Tekrom DC315 SCSi controller $ 50
Tekrom DC390U3W SCSI.....$395
Promise Ultro ATA 100 Tx2 OEM....$80
Promise Fost Trock ATA100 TX2...$240

Camera

Intel Eosy PC Comero oem.....$49
Intel Home Deluxe PC Comero.$150
Intel Pro Video PC Comera.....$225
Intel Qx3 PC Microscope.....$225
Kodok 64mb Floshcard(special)$135
Kingmax 32/64 Flashcard ....$65/$95
Smortmedio 64mb memory $99
Kodok DX-3600 with Docking.....$720
Kodok DX-3700 w/o Docking.....$710
Digital camera bags compoct $35
Digitol comero bags deluxe $65

Accessories

Arctic Silver II Thermol tube.....$20
Thermoltoke Copper Shim.....$10
8cm cose fon/3 wire..... $ 9/$15
OPTI-UPS Power VS-II 500Vo UPS $160
OPTI-UPS 525BT 315w UPS.....$195
OPTI-UPS 420ES 420w UPS.....$350
OPTI-UPS 650ES 650w UPS.....$450
Teac 1.44 Block floppy drive.....$35
Externol IDE USB cosing from $180
MS Windows XP Home Ed OEM $220
MS Windows XP Pro version OEM$340
MS Office XP SmollBusinessOEM$395
MS Work Suite 2001 OEM $160
MS Office Pro XP 2002 OEM.....$540

Keyboard & Mouse

Aopen PS/2 Scroll Mouse.....$15
Acer Slim Keyboard.....$20
LG Cordless Keyboard ond Ms ..$80
Logitech Duol Opticol Mouse.....$90
Ms Internet Keyboard Pro $80
Ms Natural Keyboard Pro $110
Ms O ffice Keyboard OEM.....$95
Ms Internet Keyboard Combo.. $65
Microsoft Explorer Opticol v3.....$90
Logitech Opticol Freedom $210
Mitsubishi Multimedia Keyboard$40
Block Keyboard/Mouse.....$35

Cables

ATA33 IDE coble 1m (6 plugs).....$15
ATA 66/100 IDE Coble 45cm.....$10
ATA100 60cm Rounded coble...$20
ATA100 75cm Rounded coble...$25
ATA100 85cm Rounded coble...$29
ATA100 IDE coble 80cm.....$15
Rounded Floppy Coble.....$15
CAT5 Rj45 2m/3m/5m.....$8/10/$15
CAT5 Rj45 10m/20m.....$20/$30
CAT5 Crossover Rj4. 2m/5m.$10/$15
CAT5 Crossover 10m/20m....$25/$35
VGA RGB BNC Monitor Cable.....$30
5.25 Power splitter.....$5
Power Coble.....$7
Porollel Printer Coble.....$5
USB Printer Cable 2m.....$10
USB Printer Coble 5m.....$15
USB Extension 2mb A-A $15
PS/2 2m Extension Coble.....$7
Monitor 2m Extension Coble.....$20

On Special

(Bonus 1x Hoyts movie pass with every items on special!)
USB Pen Drive (portable storage comes with USB extension cable, 1 yr replacement warranty)
16mb/32mb/64mb $90/$120/$170

Nomad Jukebox-C Mp3 Player 6gb Storage $650

COMPRO MPCD-455 CD Mp3 Player $240+CARKIT $50

COLORTAC LM15D
15" FLAT LCD SCREEN
90 DEGREE ROTATION
RCA/SVIDEO VIDEO INPUT
4 PORT USB HUB
MULTIMEDIA SPEAKERS
10240X768 @75HZ
(RRP $900)SPECIAL $799

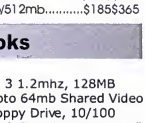
RAM

128MB/256MB/512MB PC-133.....$85/$135/$330
128MB/256mb DDR PC-2100 .....$99/165
128mb/256MB RAMBUS PC800.....$120/220
KINGMAX 256MB PC-2400/PC-2700.....$210/$215
KINGMAX 128mb/256MB PC-150 .....$110/$175
KINGMAX 128/256mb PC-133 NOTEBOOK...$110/$250
KINGSTON PC133 256/512mb .....$165/$330
KINGSTON DDR 2100 256mb/512mb.....$185$365

Notebooks

EXCEL NOTEBOOKS
EN2714D-P1000 Pentium 3 1.2mhz, 128MB RAM, 20GB Hard Disk, Upto 64mb Shared Video Card, Tv out, 8x DVD, Floppy Drive, 10/100 NIC, 56k Modem, Infra red, Firewire port, 14.1" TFT Screen, Smart Liton Battery lasts for 3 hours, Windows XP, Carry Case only **$2,995**

ASUS L8400K P3-850, 128MB RAM, 10GB HDD, FDD, 14.1 TFT, TV OUT, 24X CDROM, 56K MODEM, WINDOWS ME, LITHIUM ION BATTERY ----------$ 2,995
UPGRADE MODELS:
8X DVD.....$3,190
20GB HDD, 8X DVD.....$3,320
20GB HDD, 24X8X4 CDRW.....$4,195
-12 MONTHS INTERNATIONAL WARRANTY WITH 48 HOURS ASUS FAST TURNAROUND REPAIR SERVICE.



VISIT OUR WEBSITE FOR LATEST PRICING AT:

Www.scorptec.com.au

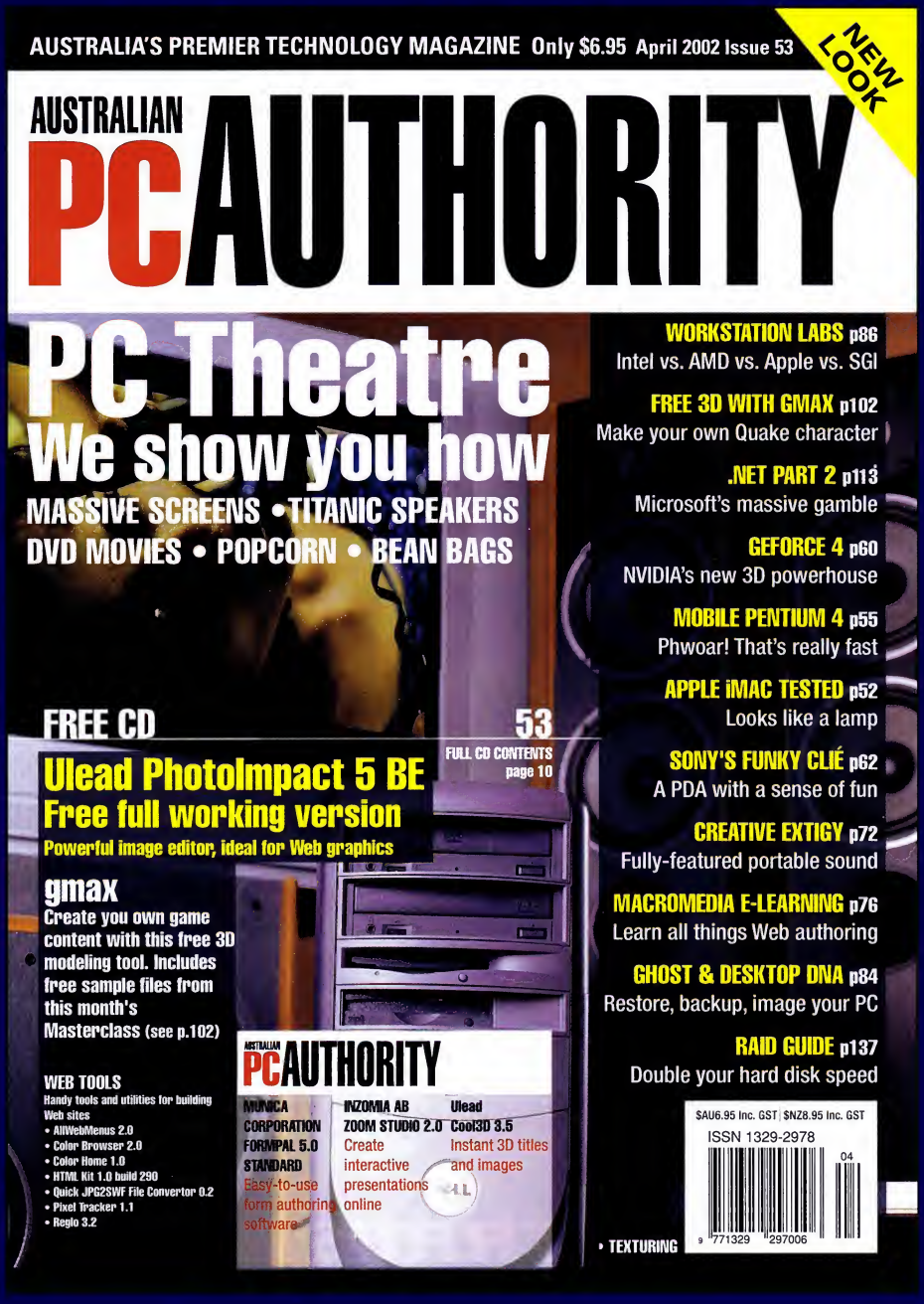
AUSTRALIA'S PREMIERE ONLINE COMPUTER SHOP

SCORPION TECHNOLOGY COMPUTERS

13 Royton St. East Burwood
Vic. 3151. Melbourne
Ph. (03) 9886 1615
Fax. (03) 9887 8560
Email: sales@scorptec.com.au

TRADING HOURS:
MON - FR I: 10AM- 6:30PM SATURDAY : 10AM - 3PM
DIRECT DEPOSIT BANKING DETAILS: BANK OF MELBOURNE
BSB: 033-385 ACCOUNT NO: 212-477

DIY PC THEATRE IN PC AUTHORITY



ON SALE NOW

C.W. Supplies

www.cws.net.au

Goods sent C.O.D or overnight with Credit card or Direct deposit.

Phone : (03) 5945 2000
Fax : (03) 5945 2001
PO Box 285
Pakenham VIC 3810.
Email : sales@cws.net.au
Dealer enquiries welcome

CPU'S Inc. Fan/Heatsink

INTEL	
Celeron 1.0GHz Socket 370	$173.00
Celeron 1.1GHz Socket 370	$184.00
Celeron 1.2GHz Socket 370	$207.00
Celeron 1.3GHz Socket 370	$221.00
Pentium4 1.6GHz Socket 478	$329.00
Pentium4 1.7GHz Socket 478	$405.00
Pentium4 1.8GHz Socket 478	$486.00
Pentium4 1.9GHz Socket 478	$582.00
Pentium4 2.0GHz Socket 478	$899.00
AMD	
Duron 1.0GHz Socket A	$139.00
Duron 1.2GHZ Socket A	$192.00
Athlon XP 1700 Socket A	$309.00
Athlon XP 1800 Socket A	$378.00
Athlon XP 1900 Socket A	$515.00
Athlon XP 2000 Socket A	$639.00

GRAPHIC CARDS

LEADTEK	
32 MB Geforce MX-200 AGP	$105.00
64 MB Geforce MX-400 AGP	$155.00
64 MB Geforce MX-400 AGP TV-Out	$167.00
64 MB Geforce3 TI 200 T AGP	$362.00
128 MB Geforce3 TI 200 TDH AGP	$449.00
64 MB Geforce4 MX440 AGP	$249.00
MSI	
64 MB Geforce MX-400 AGP TV-Out	$169.00
64 MB Geforce3 TI 200 AGP	$483.00
64 MB Geforce3 TI 500 AGP TV-In/Out	$737.00
ABIT	
32 MB Geforce MX-200 AGP TV-Out	$125.00
64 MB Geforce MX-400 AGP TV-Out	$172.00

HARD DRIVES

MAXTOR	
20.4 GB 5400rpm	$159.00
20.0 GB Viper 7200rpm	$183.00
40.0 GB Viper 7200rpm	$209.00
60.0 GB Viper 7200rpm	$271.00
SEAGATE	
20.0 GB U6 5400rpm	$159.00
40.0 GB U6 5400rpm	$171.00
40.0 GB Barracuda IV 7200rpm	$209.00
60.0 GB Barracuda IV 7200rpm	$271.00
80.0 GB Barracuda IV 7200rpm	$349.00

CD, CD-R/W, DVD' S

Liteon	
40x 24x 10x CD-R/W Kit *as seen issue 13.*	$189.00
40x 32x 10x CD-R/W Kit	$219.00
48x 40x 12x CD-R/W Kit	$396.00
52x CD Rom	$65.00
16x DVD Kit	$115.00
LG	
52x CD Rom	$69.00
40x 24x 10x CD-R/W Kit	$212.00
32x 12x 8x 8x CD-R/W DVD Kit	$276.00
Sony	
52x CD Rom	$65.00
40x 24x 10x CD-R/W Kit	$227.00
16x DVD Drive	$121.00

MOTHERBOARDS

INTEL	
D815 ATX FC-PGA Socket 478	$266.00
D815 ATX FC-PGA & LAN Socket 478	$275.00
850MD ATX RDRAM Socket 478	$323.00
845PT ATX DDR Socket 478	$269.00
845BGL ATX DDR & LAN Socket 478	$299.00
GIGABYTE	
GA-6VTXE ATX Socket 370U	$139.00
GA-7ZXE ATX Socket A	$169.00
GA-7VTXE+ ATX DDR Socket A	$210.00
GA-7DXR+ ATX DDR Socket A	$262.00
GA-8IRXP ATX DDR Socket 478	$384.00
GA-8IRM ATX DDR Socket 478	$239.00
GA-8IDML-C ATX SDRAM Socket 478	$229.00
GA-8IDX ATX SDRAM Socket 478	$239.00
MSI	
K7T266PRO-2 ATX DDR Socket A	$223.00
K7T266PRO-2 ATX DDR/Raid Socket A	$299.00
6528-LE ATX Socket 478	$223.00
6398 Ultra ATX DDR/Raid Socket 478	$305.00
6534 ATX Socket 478	$242.00
6309 PRO ATX Socket FC-PGA	$159.00
6547 ATX DDR Socket 478	$249.00
ABIT	
TH7-2-Raid ATX Socket 478	$398.00
BL7 ATX SDRAM Socket 478	$243.00
BL7-Raid ATX SDRAM Socket 478	$352.00
KT7A ATX Socket A	$194.00
KG7 ATX DDR Socket A	$312.00
KG7-Raid ATX DDR Socket A	$354.00
KR7A ATX DDR/Raid Socket A	$380.00
SOLTEK	
SL-65KV2-T ATX Socket FC-PGA	$150.00
SL-85DRV ATX DDR Socket 478	$265.00
SL-75DRV-2 ATX DDR Socket A	$209.00
SL-75DRV-4 ATX DDR Socket A	$220.00
EPOX	
8KTA3L+ ATX SDRAM Socket A	$165.00
8KHA+ ATX DDR Socket A	$210.00
8KHAL ATX DDR Socket A	$205.00

MONITORS

HYUNDAI	
15" Hyundai V560 Monitor	$225.00
17" Hyundai V770 Monitor	$295.00
19" Hyundai P910+ Monitor	$531.00
21" Hyundai G210 Monitor	$1213.00
15" Hyundai L50A LCD Monitor	$866.00
15" Hyundai L550A LCD Monitor	$879.00
17" Hyundai L70A LCD Monitor	$1672.00
18" Hyundai L80A LCD Monitor	$2478.00
PHILIPS	
15" Philips 105S Monitor	$262.00
17" Philips 107E Monitor	$316.00
17" Philips 107S Monitor	$417.00
17" Philips 107T Monitor	$399.00
17" Philips 107P Monitor	$618.00
19" Philips 109P Monitor	$982.00
21" Philips 201B Monitor	$1672.00
15" Philips 150P2D/E LCD Monitor	$1108.00
18" Philips 180P LCD Monitor	$2839.00
LG	
15" LG 560 Monitor	$232.00
15" LG 550M Multimedia Monitor	$295.00
17" LG SW700S Monitor	$323.00
17" LG Flatron 795FT Monitor	$499.00
17" LG Flatron 775FT Monitor	$427.00

ALL PRICES INCLUDE GST. FOR UP TO DATE PRICES & SPECIFICATIONS VISIT OUR ONLINE STORE : WWW.CWS.NET.AU

PC jokes

Starting your computer is like visiting your grandmother. First you sit down and make her aware you're there by giving her a little prod. Next, she lets you know how she's feeling by running through a checklist of her internal organs ('My kidneys are working well, but my bowels aren't moving much,' she tells you). She then gives you a blank face, and it's up to you to do something interesting before she crashes.

Hardcore computer users tend to humanise their machines just like this. We give them names (mine's called Cartman – because it's fat, cream-coloured, and groans loudly if I run it too hard). We yell at them if they do something wrong. We check them for viruses. Hell, we even take their temperature by sticking probes in their CPUs.

It's like they're real people.

Scientists love the idea that computers could one day be indistinguishable from your average grandparent. In 1950 Alan Turing proposed his famous Turing Test: if a machine can respond to a series of questions just like a human, it can logically be regarded as capable of intelligent thought (my housemate would do very badly at this). The test usually fails when it comes to associated reasoning:

Q: Do you like cheese?

A: Yes, I like cheese.

Q: Do you like icecream?

A: Sure I like icecream.

Q: Then do you like cheese-flavoured icecream?

(Computer pauses, then explodes, killing all researchers in the room.)

There's one important aspect that the test misses: humour. Peter Ustinov once said that 'comedy is simply a funny way of being serious'. So, by our own associated reasoning, we can assume that a funny computer is also capable of serious thought.

A study currently underway by the University of Hertfordshire in the UK seems to have found proof of such a machine – a computer that can tell jokes. Not just pre-programmed ones, but jokes made-up from its own knowledge of vocabulary.

Called The Laugh Lab, the study started as an Internet questionnaire to find the world's funniest joke. Surprisingly, one of the highest-ranked jokes is also one generated by the researchers' own computer.

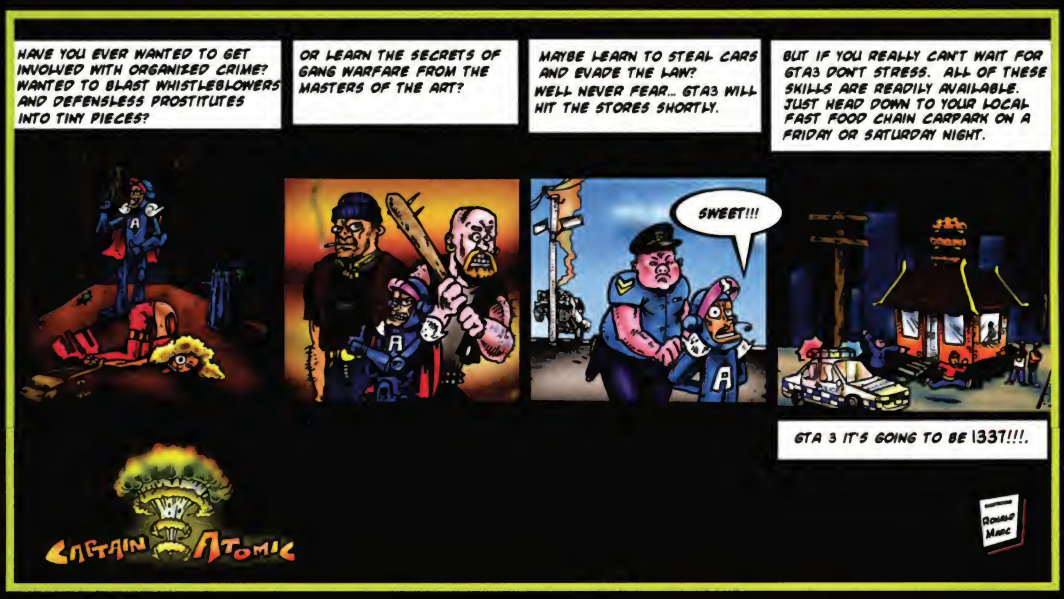
The joke goes like this: 'What kind of murderer has moral fibre? Answer: A cereal killer'. Ha. Comedians around the world are probably sweating in their seats, wondering if their next gig will be supported by a Compaq Presario or Nintendo 64.

While the researchers aren't expecting their laptop to announce a stand-up tour any time soon, they have been somewhat surprised by the results. Not only was the computer capable of drawing similarities between the two words 'cereal' and 'serial', but people (yes, real people!) voted that the joke was indeed funny.

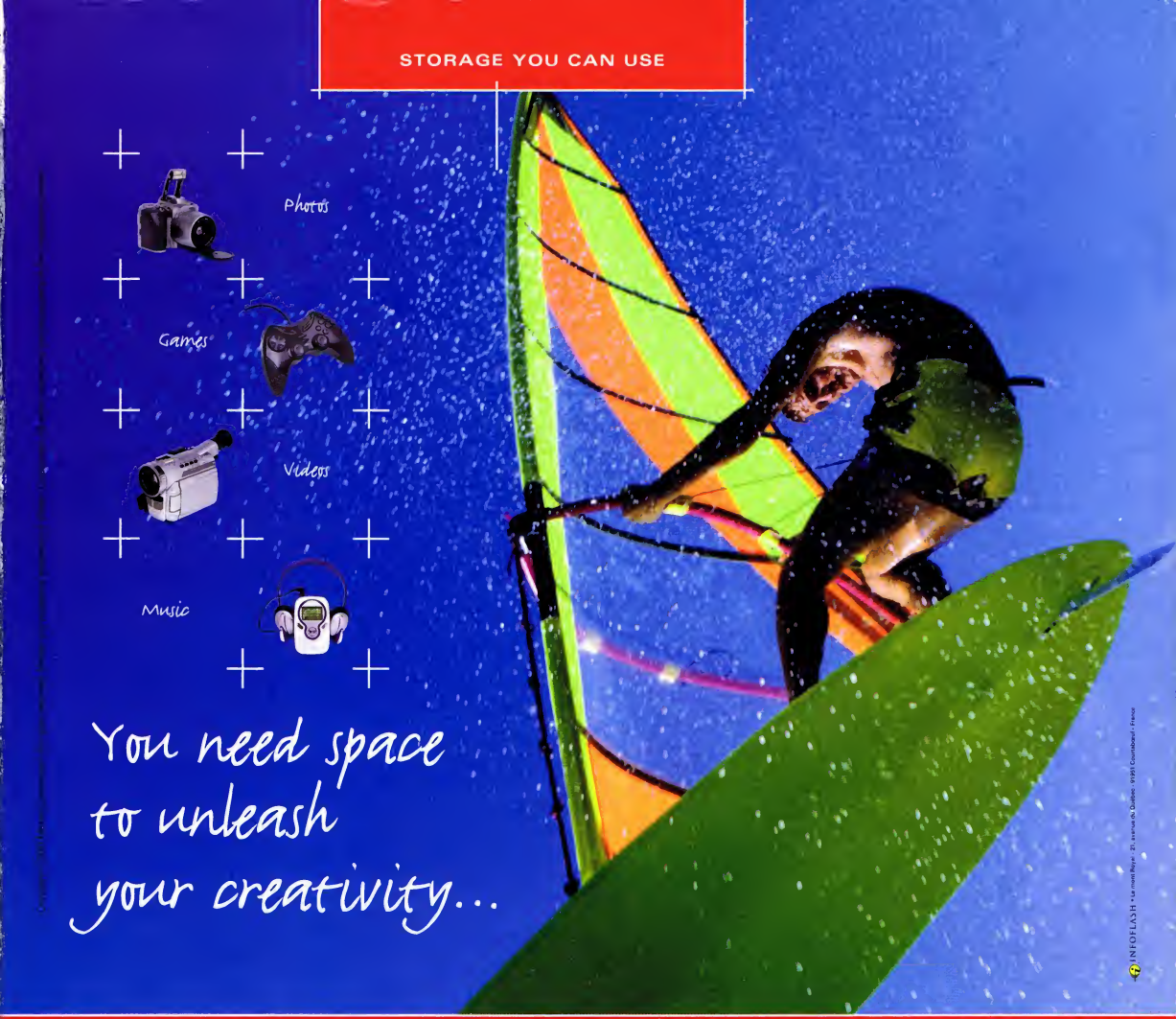
Admittedly, a computer with a sense of humour could be a dangerous thing. Imagine trying to overclock a CPU to within an inch of its life and suddenly the box refuses, announcing 'I'm a computer Jim, not a toaster'. Or, just as you're about to frag a guy in Boston, your Xbox flashes up a blue-screen-of-death followed by a little electronic snigger. Or your car's navigation unit tells you your bum's getting too big, then plots the quickest route to a weight-loss centre.

Conversely, a humorous computer-pal could make working from home a blast, and not an exercise in solitary confinement. Sitting at your workstation would be like an Abbot and Costello routine, where your video card jokes about the RAM's lack of long-term memory, and the screen dumps on the hard drive (sorry, bad pun).

So next time you go to buy yourself a PC, look for the one with a sense of humour (you know, the one that won't start unless you pull its fingerboard). We could all do with a few more laughs, especially after spending all that time with our grandmothers.



STORAGE YOU CAN USE



You need space to unleash your creativity...

Maxtor's product family meets the needs of all users, in terms of connectivity, capacity, speed, transfer rate and price.

Maxtor Personal Storage 3000XT FireWire
For users who need maximum storage capacity and push their computers to the limit (large Internet downloads, digital video editing, games, etc.), 1394 hard drives are the ideal solution (with capacity of up to 160 GB and high transfer rates) as they hold more than 12 hours of uncompressed digital video.
Mac and PC compatible.

Maxtor Personal Storage 3000DV FireWire
With its 7200 rpm hard drive and innovative electronics, this new model - which is a complement to the external storage range - is proving to be up to 56% faster than its 40 and 80 GB predecessors. Video game users can store up to 75 CD-ROM and get the performance they need for real-time response.
Mac and PC compatible.

Maxtor Personal Storage 3000LE USB 2.0
Maxtor's latest external hard drive is a genuine technological innovation. With new USB 2.0 connectivity, it offers users a transfer rate of up to 480 Mbps and up to 120 GB of storage that is easy to install and compatible with any USB-enabled computer.
Mac and PC compatible.

Available at Harvey Norman, Harris Technology and other leading retailers

Maxtor

Sound BLASTER

AUDIGY™

24bit 96kHz/100dB SNR

EAX ADVANCED HD

SB1394

Enter the World of Audigy ADVANCED HD™

Sound Blaster Audigy catapults you into the realm of Audigy ADVANCED HD, a world of high definition audio clarity and realism. Get ready to experience 24-bit/96kHz, multi-channel 5.1 sound at 100dB Signal-to-Noise Ratio, and revolutionary EAX ADVANCED HD technologies for high definition gaming and music. What's more, with SB1394 connectivity, you can now enjoy an insane transfer speed of up to 400Mbps - that's 30 times faster than the USB!

Take the quantum leap in sound with Sound Blaster Audigy!

Sound Blaster Audigy Platinum

Sound Blaster Audigy Platinum eX

Creative Labs Pty Ltd
Unit 10 Discovery Cove 1801 Botany Rd, Banksmeadow, NSW 2019

Tel: (02) 9666 6100 Fax: (02) 9666 6900
Website www.australia.creative.com

CREATIVE®
CREATIVE LABS PTY LTD